THIRTY-SIXTH FRUIT-GROWERS' CONVENTION

HELD AT WATSONVILLE
DECEMBER 7, 8, 9 AND 10, 1909

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THIRTY-SIXTH FRUIT-GROWERS' CONVENTION

OF THE

STATE OF CALIFORNIA,

HELD UNDER THE AUSPICES OF THE STATE COMMISSION OF HORTICULTURE, AT WATSONVILLE, DECEMBER 7, 8, 9 AND 10, 1909.

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PROCEEDINGS

OF THE

THIRTY-SIXTH CONVENTION OF THE CALIFORNIA STATE FRUIT GROWERS,

HELD UNDER THE AUSPICES OF THE

STATE COMMISSION OF HORTICULTURE, AT WATSONVILLE, DECEMBER 7, 8, 9 AND 10, 1909.

TUESDAY, December 7, 1909.

Pursuant to call, the Convention met in the Christian Church, Watsonville, Cal., at 9.30 o'clock A. M.

The meeting was called to order by President J. W. Jeffrey, State Commissioner of Horticulture, Mr. O. E. Bremner acting as Secretary.

The Convention was opened with an invocation by Rev. D. T. Stafford, pastor of the Christian Church.

PRESIDENT JEFFREY. We will now listen to the address of welcome by Mayor Watters. I have pleasure in introducing Dr. P. K. Watters, Mayor of Watsonville. (Applause.)

ADDRESS OF WELCOME.

By Dr. P. K. WATTERS, Mayor of Watsonville.

Mr. Chairman, Ladies and Gentlemen, Fruit Growers of the State of California: It is my pleasure as mayor of this city, to welcome you. Not only is it my pleasure, but every citizen of Watsonville extends to you a hearty welcome. Representing, as you do, one of the greatest industries of this State, and coming, as you do, from every county, every district of this State, I hope that you were selected to represent this business according to your peculiar instinct for this. The fruit industry of this State is one of the first, one of the greatest, one of the most important of all the great industries of the State, and to you, gentlemen, into whose hands the care, the fostering, the upbuilding of this industry is confided, rests its case, whether it be adversity or prosperity.

This beautiful valley of ours, which you have chosen for your convention, the unchallenged home of the bellflower and the pippin, the place where the rose ever blooms and the geranium never dies, was not a thing of chance. God made it possible, but man did the work, and until God made man with sufficient brain and brawn to pull and grub the willows, with energy enough for the present and with that faith, hope, and confidence for the future, this valley did not represent the appearance that it does to-day. Yet the greatest age that this world has ever known enlists her greatest product, her strongest force, man, at the head of her ever advancing army, in a contest not for twenty rounds nor forty rounds, but a finish fight, a contest not one of the sword or powder or bullet, not one of suffering, pain, and sorrow, but a contest that brings forth the higher, nobler principles of humanity. This is the contest, gentlemen, in which you are enlisted, and the time of service will expire when the curtain falls.

I am more particularly impressed with the dignity, with the high standing of this convention when I notice the names of the prominent men throughout the State, among which is one that I remember in my early boyhood days—I don't know that he is here—but away beyond the Rocky Mountains, beyond the once Great American Desert, in a little town in Iowa, it was a household name; a man whose family did more for the protection of the interests of the State University of Iowa than any other, and I want to tell you, gentlemen, if you have many men of the stamp and character of John P. Irish, as I knew him, the fruit industry of this State is in good hands.

In looking after the different interests, the different worms and moths, the microbes that infest the fruit, while I am not prepared to advise you or make any recommendations, I would suggest that you look after that little commercial bug that will bore in through the box and the wrappings, and all after you have it ready for its distribution, and kill the industry.

Now, gentlemen, Governor Gillett is here and will address you. Again I wish to thank you and extend to you the courtesy of this entire city. (Applause.)

PRESIDENT JEFFREY. In behalf of the convention, we thank the mayor for his pleasant words and hearty greeting at this time. Without further remarks, as the next speaker is capable of making remarks for himself, I have the pleasure now of introducing to this convention the chief executive of this State, Governor J. N. Gillett. (Applause.)

ADDRESS OF GOVERNOR J. N. GILLETT.

Mr. Jeffrey, Fellow Citizens: I am pleased to be with you here on this occasion, although I am suffering from a cold. The last time I had the honor of being present at a convention of this kind was in Marysville. I regret that I have not in the mean time had the pleasure of attending other places where you have convened.

It is well that the fruit-growers of California, representing all kinds and characters of fruit, should gather together frequently and discuss the great questions which are continually arising and confronting the horticulturists and viticulturists of California. California is just commencing—has hardly started in the growing of the fruits which will be consumed by the entire world. If you take this great big world of ours and divide it into an immense farm—which it is—you will find that in the south would be the field devoted to cotton; in the northern part of the Mississippi Valley and through Canada and those high plateaus would be the fields devoted to grain, and other parts and sections of the world are devoted to pasturage, but in all the world California would be the orchard. We have the soil, the climate, the favorable conditions to produce in this section of the world the best fruit that can be produced anywhere, and questions will arise which are very important. We can not grow the fruit without a struggle against nature and against the pests. We can not grow fruit successfully unless we have organized together for the purpose of getting it into the market to the best advantage, and you can not raise fruit successfully and feed this country and Europe unless you have good transportation, both in the cars which you use and the rates which you have to pay. So, the question of fighting the pests, the question of forming associations to market the product, the question of getting good and cheap transportation, are the great questions that the people of this State engaged in fruit raising will be confronted with, and you must settle them.

I don't know whether any of you have visited the insectary built a short time ago in your Capitol grounds at Sacramento; if you have not, come there and see the work being done by the Horticultural Commission, the study being made there every day by those in charge, discovering the insect that will destroy the pests that infest our orchards. It is a most interesting study; it is growing all the time and should have the hearty support, as I suppose it has, of all the fruit growers of this State.

Another thing which I am satisfied you are all thinking about. It is very important that there should be an association by which the fruit of California can be intelligently handled and marketed. You can not take your fruit and dump it in the East and expect to realize much if it goes there by chance. You have got to handle it carefully; you have got to control the market; you have got to work with each other and not one against another. (Applause.) That seems to be the modern way of doing business. If you were in the shingle business in Humboldt County you would do it; if you went into the copper business you would do it; if you went into mining you would do it; if you were operating railroads you would do it; and I know of no reason why the farmers of the country that are producing the product that makes great wealth should not realize this great principle of business and get together and handle the product, and not see it wasted after it leaves your hands and is put on board the cars.

Another thing of great importance, which I keep driving at continually and all the time and never stop, would be the question of transportation. I would insist to the companies that are coming to California with their roads and making wealth here, that they should provide you people with the very best cars that can be manufactured for the purpose of safely and carefully carrying your fruits to the markets of the world, and I would keep after them continually until I got a rate which is fair and just. I think this question will be settled largely when the Panama Canal is constructed. I believe there will be a change at that time largely in the way of doing business between this section of the coast and the East. When we can bring from Europe or from the Atlantic coast large ships, land them here in Monterey Bay, in San Francisco Bay, in San Diego and San Pedro—in fact, in all the ports along our coast, and received from your hands the dried fruits which you can produce here and take them and deliver them in the

East or across the ocean in Europe, we will have solved then, to a great extent, the problem of transportation; and particularly in the south, you will find your railroad facilities better, cars will come faster and rates will be cheaper, because this, to my mind, is going to settle to a great extent the rates of transportation to the East.

I was told yesterday by J. O. Hayes of San Jose that they raised this year in Santa Clara County eighty million pounds of prunes. Sixty million have been ordered from Europe, showing that there is a great market growing for our dried fruits; it is a market that will be brought closer to us when this canal is completed.

There is another question, too, which seems to me an important one—it may not seem so important to some—they say it is a sort of hobby of mine, but I believe it is one of the most important questions in this State, considering the fruit we handle, and that is the construction of good smooth highways over which you can transport your fruit and get it to market in good condition. (Applause.) If there is a State in the Union where the people in the rural districts can be so much benefited by good roads, it is California. Our fruit is easily injured. If we have it injured in any particular, that is used as an excuse to cut down the price of it, but if you can draw two tons where you are now drawing one, with the same motive power; if you can make four miles where you are now making two; if you can get your fruit to the places where it is to be packed or whence it is to be shipped, in good condition, free from dust and not jammed or bruised, we will save thousands of dollars annually to the people of this State engaged in raising fruit.

I did not come here to make much of a talk, but I am glad to be with you. I know that the fruit industry of California is our great interest, and is becoming greater every day. I want to see our citizens do everything they can to encourage our horticultural and viticultural colleges that we are building, so that we may educate our people and educate our boys to go into the country and take advantage of the rich soil and the fine opportunities that our State offers to us. California is a place where the people can live happily in the country. California is a place where we can be prosperous in the country, and we want to do all we can to attract the attention of our people from our cities out into our valley—a valley like the Pajaro Valley, a valley like the Salinas Valley, valleys that lie north and south of us, with their rich soil, the abundance of water, the great possibilities to build up in this State the class of people you always find engaged in raising fruit and in that high class of farming. That is what California needs—a population in the rural districts—and I believe our fruit farms, where the man with a small acreage can bring up his family, offer the best inducements to this end, and their intelligent cultivation will tend in the future to bring into our valleys the kind of people desired. We want legislation for the purpose of protecting the interests of our horticulturists and of our viticulturists. We want the legislation which will enable our commissioners to see that nothing gets into the State which is going to be injurious to this great industry. We must be awake all the time; we must be watchful continually, because there is placed in your hands one of the great industries of the State, and an industry which will continue to grow greater and greater as the population of the State increases and as the population of the whole country increases, because California, as

I stated in the beginning, is the orchard of America, and from our soils and from our climate will go forth those things which the people enjoy as luxuries, and which they will purchase from us in abundance if we can get the right kind of article to them. (Applause.)

PRESIDENT JEFFREY. The Governor's remarks are certainly appreciated by all. They are as broad as his office itself, which means as broad as the State. Now, I will ask Lieutenant Governor Porter to come forward and say a few kindly words of welcome to the delegates and to his own people. (Applause.)

ADDRESS OF LIEUTENANT GOVERNOR WARREN PORTER.

Mr. Chairman, Governor Gillett, and Members of this Association: I think that, in behalf of the people of Watsonville and the members of the Orchard Association, I can say that they are delighted and pleased to have Governor Gillett pay an official visit to this valley, of which we are all so proud and the products of which speak particularly for themselves. Governor Gillett and Mr. Jeffrey have covered the ground very thoroughly in regard to why you are here and what you expect to accomplish. We have amongst us here in Watsonville a man who is working along the lines in a quiet way, unassuming, accomplishing a great deal for this State. I refer to Professor Volck, who has been amongst us since 1904, and probably has done as much as any man in California to combat the pests that beset our fruits, and I thought it was opportune here at this time to refer to him, because he is an exceedingly modest man; but it is those men who, in their quiet way, pursuing their course, accomplish a great deal. Mr. Volck started in an humble way, worked himself through the University, and after receiving that education from the great State of California, now is attempting to return to them some of the benefits that he has derived in a very material way, not only helping all horticultural interests in this valley, but going abroad throughout the State; and we who are here in the Pajaro Valley feel exceedingly proud that we have a man like that amongst us who is accomplishing so much good for the entire State. And, in conclusion, I will also say again that we are delighted, not only to have all delegates here with us, but, as I said before, to have Governor Gillett, who is heartily in sympathy with everything that is for the upbuilding of California and for good citizenship. (Applause.)

President Jeffrey then read his address, as follows:

ADDRESS.

By J. W. Jeffrey, State Commissioner of Horticulture.

Another year has passed since our last conference was held, and the oldtime organization which for more than a quarter of a century has marked time to the progress of horticulture is again in session to discuss matters of interest to the great industry with which its members are associated. The year just closing has been a season of great prosperity to the State at large, and has witnessed the forwarding of many splendid enterprises of a public character and the inauguration of many new ones all to the final benefit of the fortunate people who have found a habitation in this delightful part of the Pacific coast. Many of our horticultural industries have been most prosperous, also, and yet others have experienced great depression. Broadly speaking, the outlook for the new year is very promising, and with a fair settlement of the many grave problems that are before the farmers of the State for solution the next few years should see remarkable and permanent improvement in the conditions that surround the business of fruit growing.

To a large portion of the people of California these conventions speak with authority, for they are composed of authorized representatives of the interest to which the State owes so much for her fame and material advancement. As the public comes to realize more fully that here assemble delegates with no individual interests to promote, free to speak and with courage to act, the influence of these conferences will be yet more potent in helping to shape the policies of state and foster the common weal.

That there are many new questions awaiting solution at the hands of such assemblages as this was brought most forcibly to the front by the experiences of the last two months in the Sacramento Valley. Since the first of October I have had the honor of presiding over four conventions, with an attendance in total of over one thousand growers, meeting in all-day sessions to determine what should be done to improve the conditions of more than one of our important fruit industries, and within the next few months as many more of these great conferences will be held as the time of your State horticultural officials can command. It was a revelation to me to see how these large communities of orchardists have attended so carefully to individual duties and allowed large abuses and difficulties to fasten themselves upon the business without attempting to dislodge the troubles by public effort. But since the holding of a series of these meetings, we can confidently expect that this or similar plans of considering the business problems of fruit growing has received an impetus that will carry the work to many other parts of the State, for this new movement has given vitality and force to the idea of overcoming difficulties by coöperation. So far every faction and element has joined without cross-purpose or friction, and, with one exception, by unanimous vote. As I may become somewhat pessimistic later on, I mention this spirit of unanimity as of the highest importance in the settlement of the vexed questions that may confront the fruit-farmers of the State.

In looking over the work attempted by these Sacramento Valley conferences one is astonished to see how the delegates avoided the speculative and cultural problems connected with fruit growing. Every moment of these day-long sessions was devoted to the business difficulties which had come to the surface so plainly the past season. The lesson I draw from this is that our State conventions should devote more of their energies to the solution of the economic problems that confront them, and that less attention be given to the mere increasing of fruit tonnage. I know that a State-wide convention like this must handle more general questions than the redemption of a market lost through wormy peaches. It must handle themes of interest to all. But there is no lack of large subjects for consideration and advancement by our present meeting. The interests of every commercial fruit producer in the State are involved in the farm-labor question; we should promote the safeguarding of our trees from the further invasion of insect pests and plant diseases, by the thorough enforcement of the horticultural laws; freight rates upon fruits and prompt, efficient transportation; the improvement of our State markets and the search for every possible consumer in our eastern markets, through the most effective methods of coöperation and distribution that can be devised, and not the least of the questions that should be discussed is a general propaganda against the promotion of land schemes all over the State by syndicated orchards and vineyards planted for the sole purpose of selling the land. Our convention might also profitably consider tariffs, taxation of tree and vine, National quarantine against pests, noxious weeds, fruit sulphuring, standardization of all kinds of fruits and the proper and effective branding thereof. In fact, the range of subjects that is now engaging the field of horticulture is so great that we can not go amiss for something worthy of debate and determination at these sessions, and I earnestly hope our committee on resolutions will draw up a clear and forceful declaration upon every issue which its members deem important, and that the convention will pass upon the result after due discussion and voice its sentiments with courage and precision.

FARM LABOR.

These topics remind us in looking them over how easy it is to suggest subjects, and how difficult it is to bring them to a conclusion. The farm-labor problem, for example, is one of the most exasperating, and yet I have been asked to discuss it here. It is with great reluctance that I undertake to do so, for it is a tangle of social, political, industrial and racial elements. It is like the rainbow colors revolving upon a disk. You can make the color white, or any shade into black, or every color its own, by the way you turn the circular plate. I am not sure that this comparison is good, for there are many growers here who have been trying for years to make the labor question show white, and are convinced that it will require a different revolution from any that has been tried to make it show up in anything but somber hue. But to me the lights and shadows of this issue are sufficiently bewildering even if we could bring it down to the economics of the farm alone. And when the farm-help question is carried into sand-lot discussion, into argument sociological, ethnological, and everything but simply logical, a Philadelphia lawyer could not untangle the skein. But we will leave the agitators to explain how they can reconcile the dominance of the Pacific by America, with the policy of excluding the Asiatic from all reciprocal advantage, and look for a moment to the domestic features of the hired-help problem.

With the exception of pruning and one or two other items of orchard practice the scarcity of farm labor is felt altogether at harvest time. Fruit growing has not been a growth in California altogether if we consider the building up of correlative enterprises along with it in the rural districts, such as manufacturing, mercantile, and other subsidiaries. On the contrary, fruit production has become, in many lines, an accretion of large enterprises but little dependent upon each other in husbandry and dependent upon labor in large quantities but a portion of the time. If horticulture had been a steady, slow development, as was agriculture east of the Mississippi we would have been far behind our present achievement, but there would be no labor question. If, in looking down closely into this industry, we find that it could not have been developed in any other way, and that it must be continued along the lines of large individual holdings, instead of being cut up into multitudes of very small farms dependent less and less upon hired help—if large capital is to be essential to our continued progress in fruit production, then we must look to the cheapest and most effective peripatetic labor that can be procured. Whether it be through large or small farms that California is to continue advancement I am sure that the subject of itinerant labor will always be with us in a great degree. For even upon the small fruit farm one man can grow as much fruit as ten men can harvest, and the question would be only solved to a degree, at best. In fact, one can not be sure of anything at this time upon the vexatious question of farm labor, except that it must be finally worked out upon economic lines. Whether that will come through the reduction of each horticultural enterprise to what one man can handle with the hired labor that can be had locally upon a year-long basis, as is done now in many of the citrus centers; whether these economics will come through the coöperation of both large and small enterprises in the same sections and the same lines; whether it will come through the absorption of small enterprises by the great with the ability to handle labor on the contract plan, or whether there is a good solution awaiting the genius of the fruit grower that will develop and protect our greatest soil industry without disturbing the freedom of each individual to farm just as much or as little land as he may wish—these are points upon which our delegates should shed all the light possible, for I am sure that the farm-labor problem is so great and so complicated that nothing but a far sight into the future will ever set it on the way of economic solution. At any rate I can see the futility of trying to adjust this difficulty without a concurrence of all the suffering enterprises in the State. A furtive effort here and there will avail nothing.

COMMUNITY COÖPERATION.

The farm-help problem is not the only one that should be treated upon the plan of broad endeavor. We find questions of paramount issue appearing every day, that can be handled only through general and authorized agencies. I was impressed with this lack of accredited responsibility during the session of congress at Washington last winter, in the contest over duties on imported grapes. A large body of New York fruit importers moved upon Washington with the determination to have the duties lessened, or removed altogether. A few of the California grape growers became alive to the danger, but they were without a trades representative at Washington and everywhere else. Appeals were made to the Governor, to the Lieutenant Governor, and to both branches of the State legislature to offset the work of the importers. Fortunately, an efficient California congressman had stood into the breach, and prevented the removal of the tariff. But I can not forget how helpless the grape shippers were, for they had failed to provide an effective authority in their own ranks who could bring every force to bear to prevent adverse action. Not so with the citrus fruit men, for *their* representatives were on the ground to look after *their* business, and gave all possible aid to the grape growers. I am aware that a few small aggregations of growers have made some provision to centralize their demands and efforts, but the fact remains that nearly every large interest depends upon chance or the most inadequate effort to promote the general welfare of its business. The apple growers, the grape shippers, the growers and shippers of deciduous fruits, the prune and the raisin men and the dried fruit interests should each have a league or a protective committee of some kind authorized and supported for the purpose of handling every proposition that has a general bearing upon the prosperity of the business, and to whom all could look in times of danger, or in the promotion of any measure of benefit to the whole industry. I earnestly recommend that this convention take up this matter of trades representatives, and urge every industry to make provision for the handling of its difficulties through some plan that will bring its every element into harmonious and effective action in the promotion of all its trade interests, and in protection from its perils.

OVERPRODUCTION OF FRUITS.

Again we are confronted with the cry of overproduction of orchard and vineyard commodities. We are told that thousands of carloads of grapes and peaches were grown this season and sold without one cent of profit to the producers. And it is true. The dire prediction is made, also, that the next few years will witness an avalanche of table grapes, for example, that will literally swamp markets now burdened with all they can bear. We are informed that one county is overflowing with seedless raisins upon which not even a bid has been received, much less a sale made. And this is true, also, for I had it from one of the heaviest growers in the county. How many tons of other raisins and of prunes remain unsold we shall have to leave with those versed in pessimistic figures. Even if I had the figures I would not dare to quote the tonnage of dried fruits and other fruits that never *is*, but always *to be* sold at profitable prices. Men have told me how many acres of Tokays they did not gather last fall, but I do not wish to dwell on these evidences of overproduction, for one can make himself an outcast in this way if the so-called land boomers and boosters find him out. But if you will not tell it abroad I will say to you that overproduction is a grim reality in this State in every line of fruit that is produced largely of inferior quality, or that is held for speculation when fair prices have been offered, or has not been provided with adequate means of distribution. These saving clauses make me an optimist in fact, even while setting before you the *facts* that under our present system of farm leasing and other poor methods of fruit growing, and the practice of holding large quantities of products by the growers for speculative purposes, and the practice of sending everything into the markets, and the general failure of giving the fruits broad and effective distribution, we have a surplusage. I say that in lines where these failures have occurred the outlook for profitable returns never before looked so hopeless. Of course, these growers are attempting to do an honest and straightforward business, and do not expect the profit that would accrue if they were to pull up their orchards and plant the land to eucalyptus or ginseng. But they see that their methods have not been the best, and one can not be pessimistic, or be overcome with the nightmare of overproduction, when he sees these growers engaging themselves in revolutionizing their methods in every possible way.

Then, let us all face this issue like men and women devoted to the permanent upbuilding of our greatest and most distinctive industry. The real issue is not overproduction as much as it is under-consumption of our orchard products. That is to say, there is yet room for all the first-class fruits—first-class not only in quality, but in ability to hold up well while being offered at retail. This brings to consideration the fact that California has gone head over heels into too many fruit enterprises, without proper reckoning with the market day; instead of establishing these enterprises by unfolding them in a natural way the State has inflated them, too often, into the full-blown achievement of production, without businesslike provision for selling the output, or even offering it in a way to prevent congestion. We are not here to join in the mad chorus of promoters that has so long glorified California horticulture without a grain of caution or a mite of common sense. The members of this convention are neither fogies nor faddists nor men given to bloviation for the sole purpose of stimulating activities in real estate. They will voice hopeful, inspiring sentiment concerning the present and the future of California horticulture, outspeaking with the optimism of faith the confidence of power and the courage of understanding. But they are endowed with the wisdom to condemn the foolishness and shun the danger of blindly grinding out increasing tonnage of both inferior and superior fruits without thought of the future. If I do not mistake the spirit of this conference of fruit men it will reaffirm the doctrine of "California fruit for the world," and at the same time refuse to sanction the horticulture of the "Hurrah" kind that is now menacing the very life of several of our most cherished enterprises; if I do not mistake the attitude of this convention upon the subject of overproduction, it will neither color its action to suit the exigencies of land sales nor encourage any doubt as to the future that is not justified by the experiences of the past; and if I do not miscall the courage and independence here represented, this assemblage will resolve with unmistakable emphasis upon the folly of trying to build a great and permanent industry without giving attention to the foundations upon which it must rest. I hold these ideas with confidence and serenity, notwithstanding the grave crises we are facing, for I have seen within the last few weeks convincing evidence that the fruit men of the north are not afraid to face the truth with open minds, and are not afraid of their own conclusions.

STANDARDIZING FRUITS.

One of the corner stones of a successful and permanent business is the recognition of the interests of its customers. Whole communities of orchardists are preparing to recognize this principle in greater faithfulness than ever before, and in looking into the causes that may have violated this tenet it is not surprising that the growers of good fruit are realizing that their strongest business opponents are the growers of poor fruit. This feeling has given life and vitality to a series of remarkable meetings of late, and in which the sentiment to this effect was unanimous. It is encouraging to the fruit business that growers and shippers not only realize this, but are working out plans to escape from this deadly internal peril. Suppose we could at one stroke reform the conditions of farm labor, idealize our selling facilities, provide broad distribution for all our products, and remove all adverse elements from the business of fruit growing except those of dishonest packing and branding. We should have still to face a most formidable peril, and one that would finally cause the downfall of our greatest soil enterprise. So great is the movement toward community uprightness in packing and branding our orchard products that it is unnecessary to state in detail the abuses against which is now mobilizing this great force of reformation. Nor can I trace how gradually and through the stress of bitter experience the orchardists are coming to the conclusion that fruit growing is a business as well as an occupation; that sense and discrimination in marketing are as essential as success in the production of superior fruit and greater tonnage. Nor is it necessary to remind this intelligent audience that the new movement of business introspection is a part of the great moral uplift in business throughout the country. It is sufficient that this movement to standardize and honestly brand our fruit products has its foundation in commercial common sense, and its hope in the declaration of our leading growers that an enemy is in their own camp wearing the livery of horticulture and producing qualities of fruit and enforcing methods of packing that has imperiled the whole business.

LAND BOOMING.

In discussing the economics of horticulture I have held that sufficient attention is not given to the more obscure influences that have an adverse effect upon fruit growing. Yet, for the very reason that an element is insidious, it may be the most dangerous. I am aware that I am now coming upon dangerous ground, for, unfortunately, there is no clear-cut line between legitimate and fraudulent land booming. Some land schemes are neither honest nor bogus, but in effect are certainly not for the best interests of the State. If they could all be made absolutely fair, or absolutely dishonest, or half straight and the other class crooked, there would be less trouble, for the law would handle the latter, and the public could masticate the former without distress. It is the insidious class that is dangerous. Few will allow themselves to be bitten by a rattler, but no one pays much attention to the bite of a mosquito. So it is that our growers will fight blights, and scales, and worms, and yet pay no attention to certain influences at work much more destructively than insect pests. Suppose one could segregate the acreage of orchards and vineyards now being hopelessly and indifferently farmed and tally it all on one sheet. It would be a vast community of alleged growers who had been induced to go into the business through roseate promise and extravagant claim, largely the victims of their own inadvertence and the disinterested promotion of the land seller. Hundreds of promoters are engaged in sugar-coating poor land with grapes, and oiling inferior soil with eucalyptus to make them swallow easily to the investor. This insidious practice is permeating many of our *fruit* industries, and it makes honest and efficient fruit growing realize that there is something wrong with it, but as yet it seems to have failed to locate the obscure point of infection.

If you think the virus of land speculation is not poisoning the horticultural interests of the State, go to some prominent section given to the growing of table grapes and there make a few observations. I was told last Friday by a grower who is now in this audience that scores of men in one locality had been bankrupted through purchasing land previously stubbled over with indifferent grape cuttings just to sell the land, and at exhorbitant prices. I know of one tract of several hundred acres of sand syndicated to prunes, olives, and peaches and sold at fancy prices just because the trees were there, keeping the purchasers for years between hope and despair until the sheriff kindly intervened. I was called upon some time ago to make a report upon 2,000 acres of land set out to deciduous fruits by a syndicate and sold at $375 an acre. It finally failed altogether, with a loss of half a million dollars to the investors. And yet these half-fraudulent and most always ill-considered ventures are profitable to the promoters, however much they hammer down the reputation of the State as a good place for investment and congest the fruit markets with an added burden of inferior products.

But we can not take away the right of an American citizen to be swindled, or to plunge into something he knows nothing about, and under conditions with which he is altogether unfamiliar. So we can not expect the public to come to the rescue on account of the suffering investors. But the public should concern itself with the real menace of this class of land booming, for it is the fruit-growing public that is in danger. It is the men who have put their money, their brains, and the very heritage of their children into the fruit business who are coming to suffer most acutely from this unnatural and stimulated system of land selling. The outlook is for continued exploitation, and more and more low-grade fruit, and greater market depression, increased uncertainty in land values and damage to all the interests of the Commonwealth, whether directly or indirectly connected with the cultivation of the soil. I leave this topic to the earnest consideration of the convention, with the hope that every friend of the real and permanent development of our State will discourage every form of promotion which is in fact retrogression.

In leaving to your judgment the introduction of any other subjects that may seem of moment to the members of this conference, and in the work altogether of the week I hope that every delegate will feel that this is his convention and take a lively part in the discussion. I have not by any means exhausted the list of pertinent questions that might with profit be considered. I thank you for your attention at this time, and trust to be able with your assistance to make the convention a success.

We have fared along with this address with commendable patience on your part, I am sure. This afternoon the program will be continued, and in presenting it after this morning's exercises I am reminded of an early incident in my career. Thirty years ago I was the oldest of an alleged choir of four brothers and five sisters, and we sometimes attempted to sing in public, because, perhaps, we lived in a tolerant neighborhood. At a Sunday-school picnic one time, after my choir had sung for these patient farmers, as long as the Mayor, the Governor, Lieutenant Governor and I have talked to you to-day, the Sunday-school superintendent stepped forward to introduce the string band of three pieces from a neighboring farm. "Gentlemen and Ladies," he said, "we have had the singing, now we will have some music." This afternoon the real music of the convention will begin—

the music of experience, and discussion, and endeavor, to promote by every means the best fruits, the best markets, and the best of everything that may advance the resources of the best State of all of Uncle Sam's great domain. Again I thank you. (Applause.)

MR. BERWICK. I would like to employ a few minutes now, if the convention would be pleased to hear me, as my time here is very limited.

PRESIDENT JEFFREY. We will be pleased to hear from you Mr. Berwick. You are an honored member of this convention and have been for years. (Applause.)

MR. BERWICK. *Governor Gillett, Mr. President, Mr. Porter, and Gentlemen of the Convention:* I am sure you are all pleased and unite with me in thanking the Watsonville people, including Lieutenant Governor Porter, for their kindly reception here this morning. I know, also, you will concur with me in thanking Governor Gillett for his good suggestions made to us this morning, and also Mr. Jeffrey. I want to remark on one thing Governor Gillett has said, that the Panama Canal is one great hope of the fruit growers. You may recall that for many years I had the honor of being chairman of your canal committee. In fact, I believe I was all sorts of a crank—among others, a canal crank. I am glad now to be officially justified, and to know that the canal is largely the hope of California. I am glad to hear, through Mr. Jeffrey, that this convention as a whole is not here to discuss small questions, but economics is one of the great things we are here to talk over. I have been talking over economics on behalf of you fruit growers for a good many years. You may recall, in Los Angeles, about five and a half years ago, you growers kindly put me at the head of what we call the Postal Progress League of California. It was one important effort toward solving the transportation problem. You know other countries have a very efficient postal service that carries parcels of all kinds of things through the mails and assists very much in distributing large quantities of produce. A man from Japan the other day told me: "In Japan I had butter sent 700 miles at a charge of 25 cents for a ten-pound package." A lady told me about two days ago: "I was living in England, a little way from London. I had oysters sent me through the mail." You can have all sorts of things sent by mail there and distributed very economically to consumers. One of your great problems is economic distribution, to get as directly as possible to those who consume your products. The parcels post is one of these agencies. In England one house of seedsmen sent out 70,000 packages in two days. You can see the extent to which they avail themselves there of parcels post. If you are a farmer you can have the mail cart stop at your gate, on your giving due notice, and take your products from your gate to distribute all over England, at very low rates. Germany has the same agency; even Japan has the same agency.

For five and one half years, as some of you know, I have been working to influence politics here that we may have congress give us the same agency. It depends entirely on congress. The President has no power, the Postmaster General has no power to alter the rates, but congress has. But, as you know, gentlemen, unfortunately the machine largely dominates politics and the transportation companies largely dominate the machine. There is one way of getting this thing, and one only, that is, for you people to make your voice heard with no uncertain sound as to what your wishes are.

I had a lesson some years ago at Stanford University. I was one who spent a week there some years ago, a week to fruit growers they gave us when the university opened. I was a tenderfoot about college yells—I had been in the backwoods most all my life. I was sitting in the Encina dining hall and I was electrified by the shock of hearing something like this: "WE-WANT-OUR-PUDDING!" Do you know what happened? What do you think happened? The boys got their pudding. Now, when you want parcels post badly enough to halloa together: "WE-WANT-A-PARCELS-POST," you will get it. We meet here, have been doing so for twenty-five years past—I have—and I recall in Los Angeles in one of the earlier conventions I moved some resolution. Mr. A. R. Sprague, whom many of you know, said: "What is the use of passing resolutions, anyhow? They don't amount to anything." I recall I replied in some lines of Lowell. I said: "My friends, you can't put less value on these things than I do. I will give you a quotation from Lowell. It is in the Yankee dialect, something like this:

> "'So they meet in convention and git up hooraws,
> An' tramp through the mud for the good of the cause;
> An' think that they're kinder fullin' the prophecies,
> Wen they're only just changin' the holders of offices.
> Where A sot before B's now comf'ably seated,
> One humbug's victorious and t'others defeated;
> Each honorable doughface gits just wat he axes,
> An' the peepil their annooal sof' sawder an' taxes.'"

Now, gentlemen, I am here to-day to tell you this. We can't often get a chance to do anything at Washington. Most of you know Mr. John S. Dore of Fresno. He is a good, sterling man. He writes me he is willing to go to Washington, he and his wife, and settle down there for the session and fight for parcels post for you, if you will just pay their railway fares; he will do the rest. I want you to think it over. If you want something done, now is the chance to do it. I have been trying to do all I can. I have a letter in my pocket now from the Postmaster General's secretary saying when Mr. Hitchcock gets through his week's work on his report he will take up parcels post, but he will take it up a great deal more vigorously if all you people shout. If you want an easy way of regulating transportation there is no better way than by demanding the parcels post. Now, I don't mean to stay here—I have got another engagement—through this whole convention; that is why I came on this morning, through the kind permission of the authorities, but I will appoint Mr. Charles Rodgers, Mr. A. N. Judd, and Mr. B. E. Hutchinson of Fresno to receive any contributions you want to give to send Mr. Dore on to Washington. If you think it is worth while, do so; I know how the fruit growers are usually; when it comes to paying down their cash they are not exceeding rapid; but I understand in Watsonville you growers are all bankers as well as farmers, and so I appeal to you to help yourselves. Heaven helps those that help themselves. Now get it, and hustle and help yourselves. I thank you. (Applause.)

PRESIDENT JEFFREY. I thank Mr. Berwick very much for his talk. We will now adjourn until afternoon.

A recess was here taken until 1.30 o'clock P. M.

AFTERNOON SESSION.

PRESIDENT JEFFREY. If there is no objection to the regular order that has prevailed in these conventions for a generation, I will now announce the vice-presidents and the two committees which we have always had. The vice-presidents will be C. H. Rodgers, representing the fruit growers of Pajaro Valley, and E. J. Wickson, representing the Agricultural College of this State. The Committee on the President's Address will be G. P. Rixford, representing the United States Agricultural service, and Roy K. Bishop of Orange County, one of the horticultural commissioners of the State. The Committee on Resolutions will consist of George D. Kellogg of Newcastle, A. N. Judd of Watsonville, and J. P. Dargitz of Acampo. Mr. Kellogg is a fruit-grower and shipper. Mr. Judd is too well known to need any introduction to this community or to the members of this convention. He always attends, and he will do his work on this committee. Mr. Dargitz is the secretary of the California Fruit Growers' Exchange, resides at Acampo and a fruit gower at that place. The first paper on the program this afternoon is "Southern Oregon Apple Growers—Rogues in Name Only," by Mr. William M. Holmes, a prominent apple grower of the Rogue River country and a resident of Medford. Mr. Holmes has written me that he was called on a water lawsuit occupying yesterday and to-day, but he has sent his paper and it will be read to you and subject for discussion the same as if he were here. The secretary will now read the paper.

SECRETARY BREMNER. I might say that this gentleman has two boxes of apples here, showing their standardization and uniformity of pack, which are down at the Board of Trade rooms, where you can see them.

SOUTHERN OREGON APPLE GROWERS—"ROGUES" IN NAME ONLY.

By WM. M. HOLMES, Medford, Oregon.

It is a somewhat significant fact that the Rogue River Valley in Oregon, where the writer has resided for the past twenty-six years, owes its present position in the world's fruit trade largely to the good judgment and horticultural knowledge of a veteran in horticulture from the State of Illinois. There is no better illustration than his experience furnishes that methods of culture and selection of varieties must conform to local conditions. From the day when Hon. J. H. Stewart, now deceased, first saw upon the banquet tables of the Pioneer Association, assembled in annual reunion at Jacksonville, Oregon, a finer display of prime apples than he had ever seen at a state fair in the Mississippi Valley, he became a staunch advocate of commercial fruit culture in southern Oregon. Urging upon his neighbors in the early eighties, before as yet the transportation was provided, the necessity of preparing to supply the Eastern demand for such choice fruit, he himself planted more than one hundred acres of apples and pears, fortunately including a good proportion of yellow Newtown pippins and Bartlett pears. Unfortunately, as usually happens when horticulture is in the experimental stage in a new district, many varieties were set which later proved not to be good commercial kinds, although yielding good crops. At that time there were many small family orchards scattered through the valley, affording a demonstration of what varieties were best adapted to the soil and conditions. A favorite among the early settlers, and found everywhere throughout the valley, was the Esopus Spitzenburg. Prior to the advent of the railroad, there were practically no fruit pests. The codling moth did not make its appearance until about 1890, closely followed by the San Jose scale. With the scale, those thrifty old family orchards became a matter of history. No effort was made to save them, and for a time even the commercial orchards seemed to be doomed. When the first salt-lime-and-sulphur formula was introduced, even applied with the crude man-power sprayers then on the market, it was apparent that science had triumphed over the pest. When gasoline power was used, and the first gasoline engine used for this purpose was equipped and used in a Rogue River apple orchard, very effective work was done in spraying, and each year has seen an advance in methods and a wonderful growth in acreage of orchards in the valley, until to-day there are no less than fifty thousand acres of apples and pears planted and approaching maturity in the valley.

To-day the major portion of the apple trees planted each year in this district are of the yellow Newtown and Spitzenburg varieties. Since the first shipments were made directly from the grower to the distributing firms in London, the English trade has shown a decided preference for the Newtowns from this valley, and since the year 1900, when the grower first came in direct touch with the market here, the price has been uniformly good, car consignments frequently averaging three dollars per fifty-pound box, free on cars at shipping station. Until within three years there was the same effort made by the grower to excel in size of individual Newtown Pippins that still distinguishes the demands of the American red apple trade. It became evident, however, that the more conservative Englishman finds the four-tier, or 128 to the box, size more to his liking than the abnormally large apples, and that is the type most sought for at present. The tree is hardy, vigorous, and very productive in this section, and the smaller sizes being most in demand, the labor and expense of thinning the fruit of this variety is reduced to the minimum. The tree is allowed to bear to the limit, and in case of an unusually dry summer, if water is available, two moderate irrigatings are given the trees. Irrigation is not here considered essential, and yet all concede that it adds immensely to the yield of all apple trees, especially those over fifteen years of age. It will be resorted to much more in future than in the past, for as yet the bulk of the orchards in the valley are young.

Oregon prides herself especially upon her "red" apples. And yet the best of all the red apples, and the one best adapted to Oregon conditions, the Spitzenburg, has not proven nearly so profitable as the Newtown in the orchards of southern Oregon. Nor can it adapt itself so well to all soils, ranging from the volcanic ash to the black adobe, in all of which the Newtown thrives. When the conditions of soil are just right for the Spitzenburg, however, that blend of alluvium or sediment soil with the wash from the foothills, on which was produced the car lot of Spitzenburgs which in November last won the capital prize at the Spokane apple show, no other district on earth can surpass the Rogue River Valley in its production. The orchard which this year won for its owner the crown of an "Apple King," has produced car after car of just as fine apples in the past, but awaited the sagacity of the man who knows and the man who had the enterprise to enter the contest to win plaudits from ocean to ocean. Through the medium of the writer, the present owners purchased this orchard in 1906, men entirely without experience in horticulture, and it is sufficient to say that they have deserved all the success they have obtained in winning this world's prize, for they have applied good, hard business sense to the management of their orchard, and there is no better in the best district in the Northwest.

The close student of the markets knows that in the immediate future other varieties of apples will be planted largely in the Rogue River Valley, although to-day even the residents find it difficult to procure the Rome Beauties, the White Winter Pearmains, Yellow Bellefleurs, Jonathans, and Ortley Pippins, which once filled their cellars for winter supply. Of these, the Rome Beauty and the Ortley will unquestionably be planted in a commercial way, on account of their uniformly high quality and productiveness. The Jonathan and the Stayman Winesap will also divide honors with the Spitzenburg for both are productive, very precocious in bearing, and much hardier than the Spitz. It is even predicted that in certain locations in a few years blocks of Ben Davis will be set, for that old standby is holding its own in productiveness, and with all its inferior quality, there are orchards in the Rogue River Valley of this fruit which are almost as good yielders in dollars as the choicer fruits.

In setting an apple orchard in this valley it is the uniform practice to use yearling nursery stock, and many prefer the medium sizes to the overgrown stock which was once in greatest demand. It is preferable to set on land which has been in cultivation for some years, and many of the most flourishing young orchards are growing on land which had been "farmed to death" in the days of wheat production. While the apple itself is a shallow-rooted tree, it finds the elements it wants in the subsoil below the level robbed in grain culture through former years. Thorough preparation of the soil, often with subsoiling at least the tree-row, is practiced and after setting the land between the rows of trees is either cultivated with spring-tooth harrows, extension tools and weed-cutters, or planted to corn, potatoes or other hoed crops, and at times set to berries. Berries, however, require irrigation to be successfully handled, and our growers do not, as a rule, approve of irrigation for young trees, at least not until they have grown for some years with surface cultivation. The idea is that the roots of the young trees will extend further into the subsoil without irrigation, which may or may not be the case. Corn is the great "expense crop" grown between young trees in this valley. Other varieties come into bearing younger, but if an expense crop is produced on Newtown or Spitzenburg trees the sixth year in this valley, the grower is well satisfied. Many are now resorting to peach tree fillers, to expedite returns from the orchard, and this course is now considered good management, as conditions for peach culture are very good also in this valley. The markets, too, are accommodating, the northwest coast cities growing rapidly, and the product of the different varieties of peaches produced here coming to maturity after the California crop and in advance of the Columbia peach districts. It is customary to remove these peach tree fillers at about the tenth year. Some are setting them in the apple tree-row one way only; some in the center of the square. Of course, it adds greatly to the labor of cultivation.

While it is true that with the scale and the codling moth to combat, the southern Oregon orchardist can always keep busy, yet it is also true that, aside from these two foes, apple culture in this valley is beset with less trials than in almost any other district. Young trees are afflicted with green aphis, but the tobacco mixtures are found very efficacious, and fortunately there is but little trouble with the woolly aphis. Anthracnose at one time caused some solicitude, but Bordeaux applied before the leaves drop and again later in the season not only acts as a preventive, but effects a cure if the trouble is not of long standing. Apple scab is not a menace, the long dry summers protecting from this foe to the yellow apple. Some varieties of the apple are rather susceptible to the pear blight, but with ordinary caution it is handled successfully.

The class of men who are devoting their energies to apple culture in this section is perhaps the best guarantee we have of its continued success. There are probably two thirds of the men engaged in horticulture in the Rogue River Valley who have retired from active business or professional life, drawn back to the soil by that agrarian movement which bids fair to reverse the current from the farm to the city; and but very few orchards in this valley are in the hands of tenants. There are far too many large holdings in the valley, inviting labor troubles in the future. Thus far, the output of the orchards has been easily handled, but each year for several years to come should double the number of cars shipped, and it is foreseen now that the surest provision against labor scarcity will arise from the small land holder with surplus teams and help within his own family. Many of the large orchardists at this time are enabled to compass their field work in due season by offering especial inducements to neighboring men, with teams and equipment, and this phase of the business affords the man with a family of growing boys the opportunity to develop his own small orchard and obtain the wherewithal to live and improve his tract with surplus work for others, at very remunerative figures.

The regularity of crop production is here remarkable. Four times within the last ten years good apple crops have obtained high prices, owing to the short crops in the Eastern States. This has much to do with the immense returns obtained by our orchardists each year. Late spring frosts cause some damage, but with commendable system, and with the assistance of the government pathologist now stationed at Medford, during the last season telephone alarms were sounded on critical nights, and orchard heaters and small piles of light, dry wood, ignited with kerosene, saved the crop on low ground and demonstrated the possibility of thus saving the crop every year. This work was really without the province of the pathologist, but at the solicitation of our horticulturists, and with the consent of the weather bureau officials, Mr.

O'Gara very accommodatingly placed his knowledge at the disposal of the growers.

The matter of standardizing the pack of the valley has received much attention during the past year, and through the different associations of growers, it is a certainty that within another year this valley will be distinguished by as uniform pack and thorough business marketing of of our product as now characterize any other district. Each year it becomes more apparent that quality and uniformity alone will bring the largest returns. (Applause.)

PRESIDENT JEFFREY. I would like for the delegates to jot down any point in any of these papers that you wish to discuss afterwards. You will be given the opportunity now to discuss this paper, if you wish, for a short time, but at the end of the session we should have these matters thoroughly discussed. This paper just read is a very valuable paper from an Oregon standpoint. Mr. Holmes was an old friend of mine. I have not seen him in thirty-five years and I hoped to have seen him to-day, but I have had correspondence with him and know that he is succeeding in the same things in which you are succeeding here in Watsonville. I now have the pleasure of calling upon Mrs. Josephine Rodgers of Watsonville, who will speak on "Apples on Our Menu." (Applause.)

MRS. RODGERS. *Mr. Jeffrey, Governor Gillett, Ladies and Gentlemen of this Convention:* I think on this occasion I can fully sympathize with men that have been called to address our women's conventions. In this case women are in a minority in the audience as well as on the program.

APPLES ON OUR MENU.

By MRS. F. J. RODGERS, Watsonville.

There is no fruit which has so many legends associated with it, or so much mythical history connected with it as the apple. It being such a common fruit, few people stop to consider its food and medicinal value. It is an excellent brain food, because it contains more phosphoric acid in easily digested shape than any other fruit known. Eaten raw, there is no better stimulant for the sluggish liver, as an apple or two eaten before going to bed will often be more effectual than the use of drugs. It helps the kidney secretions, and prevents calculous growth. It obviates indigestion, unites surplus acids of the stomach, disinfects the mouth, and is one of the best preventives of diseases of the throat. It also promotes sound and healthy sleep.

It is a welcome visitor to the housewife, epicure, and invalid, and grieves no one unless it is the doctor. No doubt this old saying is familiar to you all:

"An apple a day
Will keep the doctor away;
An apple at night
Puts the doctor to flight."

Aside from its splendid medicinal values it is one of the best antidotes known for the thirst and craving of persons addicted to the use of alcoholic stimulants.

Books have been written on the curse of drink and its cure; institutions have been founded for the recovery of the inebriate; different kinds of drugs and patent medicines have been placed on the market; much money has been spent seeking cures, and persons will suffer all their lives from this habit, when this simplest and most inexpensive of all cures lies within their reach. No man or woman who likes fruit has an appetite for drink and *vice versa*. The two tastes are at enmity with one another, and can not live in the same constitution. One will destroy the other.

The necessity of fruit all the year around as part of the daily diet is generally acknowledged, and among fruits the apple heads the list, and hence should occupy a prominent place on our daily menus.

The different ways in which the apple may be served are almost without number, though the ordinary cook has on her list just about three—apple sauce, baked apples, and apple pies. While these are delicious, the housekeeper should guard against monotony of diet. The manner of cooking and serving the same thing makes a wonderful difference. With the apple fresh, canned, or dried, the housewife finds a splendid addition to her supply closet, and may prepare at any season on short notice many delectable dishes. Among the most attractive delicacies obtained from this fruit are jellies and preserves, whose flavors vary according to the apple used.

If still further variation in flavor is desired, it may be obtained by the addition of other fruit juices or flavoring compounds; and what nicer accompaniment to hot biscuit, griddle cakes, waffles, etc., and also what more appetizing accessory to the school lunch or picnic basket. In crystallized form it makes a nice addition to the bon-bon box. Apple juice appears for table and cooking purposes in the form of cider, and vinegar, and in this connection it is gratifying to note that since the enforcement of the pure food law we can obtain these articles unadulterated. Of course, everybody enjoys cider as a beverage. Cider also is a very necessary ingredient in making the best quality of mince meat and apple butter.

For salad dressings and various sauces for fish, meats, and vegetables, some acid is desirable, and nothing is better than pure cider vinegar.

The different menus require the preparation of the apple in various ways. A delicious breakfast dish to be served with the cooked cereal, or alone, consists of the apple baked, or pared and sliced, sprinkled with fine sugar and dressed with cream.

The apple fritter, a general favorite, may be served either for breakfast, luncheon, or as an *entrée*. Fried apples served with pork chops or sausages are a suitable cold weather diet.

What cook would think of serving roast goose or a roast of pork without apples prepared in some way, usually as a sauce or baked? What can take the place of the old standard American apple pie, baked with two crusts, or the English tart, with one crust only, and that on top?

If the cook wishes to please the appetites of men, the dessert that delights the heart as well as the stomach, is a pudding, and lo! the number that can be evolved from the apple—boiled, steamed, and baked. Probably one of the simplest and easiest to make consists of bread or cracker crumbs arranged alternately with sliced apples, and seasoned with butter, sugar and spices, then baked—"Brown Betty" by name.

Then we have dried apple duff, which in pioneer days was a favorite dessert with the miners; roly-poly, boiled or steamed apple dumplings, and the apple suet pudding, which should find a place on our menu oftener than it does during the cold weather. Puddings made of corn meal and apples, rice, tapioca, or sago and apples, with various flavorings, are exceedingly nutritious and at the same time inexpensive.

As for cakes, we have the well-known Dutch apple cake; also the farmers' fruit cake, which has for one of its main ingredients, dried apples, and is a good substitute for the more expensive fruit cake.

A preparation of grated apples, egg, and flavoring makes a most delicious filling for layer cakes. With apples, a splendid short cake can also be made. It is only of late years that the apple has been used to any extent in the making of salads; combined with nuts and celery in various proportions and served with the usual dressings, it has become very popular.

With this brief outline and considering the occasion, further detail is deemed unnecessary. Suffice it to say, however, that the various recipes for this fruit are so numerous that it could appear on our menu in a new form each day throughout the year. (Applause.)

PRESIDENT JEFFREY. Is there any discussion at this time on Mrs. Rodgers' paper?

MR. DARGITZ. Mr. Chairman, just one word. As a physician, I used to wonder just what made people say that apples were golden in the morning, silver at noon and lead at night. It has been my practice all my life, when I could get good apples, to eat two or three apples every night before I went to bed, and they never hurt me. You can look at me if you want proof.

PRESIDENT JEFFREY. Now, we have apples in southern California. Perhaps some of you are not aware that we have one of the largest orchards in the State there. We will hear from Mr. Frederick Maskew, the Assistant Superintendent of the State Insectary, who is next on the program with a paper on "The Apple in Southern California." (Applause.)

THE APPLE IN SOUTHERN CALIFORNIA.

By Frederick Maskew, Long Beach.

Mr. Chairman, Ladies and Gentlemen: As the program sets forth, I am to talk to you about the apple in southern California. To the best of my knowledge and individual experience, the apple proceeds along about the same lines in the direction of its final resting place in southern California as elsewhere, to wit: pies, sauces, dumplings, dessert, and many other of those delectable delicacies that Mrs. Rodgers has just told you about.

Southern Californians may be orange growers, but they are apple eaters, and possess in a marked degree that fondness for good apples which is characteristic of the entire American people. I am telling this for the benefit of the visitors who are present. The apple growers of this valley, judging from the amount of fruit they send down each season, know that their apples meet with the same royal reception in southern California as elsewhere.

What I had in mind when I prepared this paper was the apple orchards of Los Angeles County. Of these, their history and behavior, I have accurate, first-hand knowledge, and I had thought perhaps a relation of the lessons drawn from an extensive study of the conditions obtaining there might prove of value to prospective planters of commercial apple orchards, desirous of extending the industry into new and untried regions.

I have attempted to confine my statements to-day to a few of the fundamental principles underlying successful apple orcharding in any country, preferring to leave the details to some more able pen than mine.

With a very few exceptions, the older apple orchards of Los Angeles County, ranging in extent from 1 to 10 acres, are merely an incident to the general business of agriculture, and as such have passed through all the vicissitudes common to such an arrangement. A careful study of these orchards shows clearly that the conditions found there are by no means due to fundamental causes, such as soil, moisture, or climate; they are simply the logical accompaniments of lack of knowledge of suitable varieties and poor methods of management. Especially is this so in the selection of varieties.

The condition of most of the fruit found in the earlier planted orchards was due entirely to lack of this knowledge of varieties suited to the local environment. The soil was suited to the requirements of apple trees. Governed by this fact, the planters of these orchards, without any local precedent to guide them, selected the varieties from the knowledge they possessed of their behavior in other parts of the country, failing to recognize the truth of the fact that rarely indeed does a variety maintain for itself the excellence that has gained for it a reputation when removed from the immediate locality in which it first attracted attention. The result of this was, that while the trees made all the growth desirable, the size, shape, color, flavor, quality, habit of bearing, and time of ripening of the fruit by the most of the varieties planted, was so modified as to be in some instances almost unrecognizable. One of our best pomologists has set forth the axiom that specialization in varieties can never precede; it must always follow the extension of horticultural centers. Yet it is fully recognized that specialization in varieties is the custom of the period, and to it can be traced the reputation and financial success of the famous apple-growing sections of the world.

A full realization of the truth of these two fundamentals is what makes it so difficult to furnish reliable suggestions in relation to the varieties suited to new territories. Apple trees will grow and thrive in a great variety of soils; in fact, the apple is preëminently the fruit of the masses, and in consonance with this Nature has endowed the apple tree with a greater power of adaptability than that of any other fruit tree known to horticulture. Notwithstanding all this, those desirous of extending the industry—and they are legion—must keep in mind the fact that it is the quality of the fruit more than the growth of the tree that makes the reputation of the locality and the fortune of the planter. The best we can do on this point is to generalize, and at the same time emphasize the point that those desirous of planting commercial apple orchards in untried regions should take pains to thoroughly familiarize themselves with the behavior of the varieties growing in apple sections having climatic conditions similar to the one in which they propose to plant, both through their own observation and extensive consultation with successful orchardists.

There is no feature of commercial apple orcharding that should be given more serious consideration than the selection of the permanent varieties.

One of the most prominent features in these orchards that have been under consideration in this paper was their tendency to produce large crops of fruit. In many of them there were almost as many different varieties as there were individual trees. Still the full-bearing habit was universal. Out of this infinity of varieties came two that were paramount to all others, the White Winter Pearmain and the Yellow Bellefleur. These, in common with the others, produced good full crops of fruit, and the fruit possessed a good market value. Close observers soon commenced to realize that these varieties could be grown at a profit, and with a view to enhancing these profits commenced to plant out orchards composed entirely of one or the other of these two varieties, especially was this so of the White Winter Pearmain.

Thus commenced what may be considered the second period of apple orcharding in that region. The young trees in these orchards grew with all the customary vigor of the White Winter Pearmain, but they failed to set a crop of fruit. Season after season, when the Pearmain trees in the older orchards of mixed varieties were breaking down under their load of fruit, the younger orchards set in solid blocks of one variety were not producing a box to the tree.

I have in mind a number of these orchards and their owners, with both of which I was intimately acquainted at that time. Without taking up your time in going into details, I will state that these conditions brought those who were vitally interested in this matter face to face with the question of cross-pollination and its bearing upon the production of fruit in commercial apple orchards.

The many influences that enter into the normal failure of the fruit blossoms to set, such as heavy wood growth in the young trees, the attack of insects and fungi on the blossoms, frost, rain, and other unfavorable weather during blooming season were all given careful consideration during the investigation that was made of this problem by a numbers of the leading apple growers of that section. Many arguments, many of them very ingenious, were made pro and con as to the value or even the desirability of cross-pollination. It was, however, clearly recognized that self-sterility is not a constant character with any variety. The same variety may be self-sterile in one place and nearly self-fertile in another. The adaptation of a variety to soil and climate has much to do with its self-fertility. It would be fallacious to attempt to separate apple trees into two definite classes, the self-fertile and the self-sterile. All this goes to show that the problem is as much a study of conditions as of varieties, and that we can never be perfectly sure that any variety will be self-fertile in a new region. Planting for cross-pollination purposes as a matter of insurance in fruit production is now becoming a general orchard practice.

The practical bearing of the problem is this. There are certain varieties of apples that, due to their profitableness, we wish to grow largely for the general market, but we find that they can not be depended upon to produce full crops when planted alone. They need the pollen of other varieties to make them fruitful. Then we must plant other varieties near them as pollinizers.

Having determined upon the variety to be grown for a general crop, the most important point in the selection of the pollinizer is that the two shall blossom at the same time. The only way in which a pollinizer can be of service in promoting fruitfulness in the variety planted for the general crop is by supplying it with pollen. This means that the pistils of one variety must be ready to receive the pollen when the stamens of the other are ripe; this is only possible when both varieties bloom simultaneously.

The comparative blooming of varieties is something of a local problem. Difference of location, altitude, soil and weather, govern the time of appearance of the blossoms, but a series of observations made by the writer tends to show that while the date of blossoming may be hastened or retarded by local conditions, the comparative time is approximately the same for different varieties in localities having similar conditions of soil and climate.

The variety to be used as a pollinizer is, of course, governed by the variety to be planted for the main crop. This question having been decided, the next question is to know how many trees will be necessary to pollinate the self-sterile variety. This brings us back, in so far as my knowledge extends, to the apple orchards of Los Angeles County.

Out of the failures, disappointments, and difficulties of the two periods of apple growing just described came the apple orchards of to-day. A study of these will show that the owners are beginning to pay more attention to some of the finer problems of apple culture, such as the relation of varieties to pollination, their susceptibility to disease, the individuality of trees, a better class of nursery stock, and the question of selecting the buds and scions for propagating purposes. In these young apple orchards can be seen on every hand the principles of selection, planting, and pruning advocated by Wickson, Powell, and others, applied all unconsciously, perhaps, of their origin by the workers, but in evidence, nevertheless, to the close observer.

Such an orchard is the one owned by Mr. Cudahy at Florence. Here there are 30,000 apple trees in one block. To insure fruitfulness in this orchard, one row of pollinizers was planted to each eight rows of the varieties considered best adapted to the location of market demands. The pollinizers were planted in straight rows to facilitate harvesting. Fall Pippin was used principally as a pollinizer for the White Winter Pearmain, and in some instances Yellow Newtown Pippin for the Yellow Bellefleurs. I was in this orchard about fourteen months ago, and from my own observation, as also the statements of the superintendent, this arrangement had proved satisfactory from the standpoint of the production of fruit.

In the effort made by the apple growers of the region we have been considering this afternoon to take advantage of all the lessons learned from the two preceding periods of the industry, great attention was paid to the question of the quality of nursery stock. A bud on a whole root was considered the standard of excellence, and it was soon learned that a more uniform stand of symmetrical trees could be obtained by planting those with a straight whip-like top of one year's growth than from those that had been grown the second year in nursery rows. The conditions that resulted in this decision were found to be as follows: In well-grown one-year-old wood every eye or bud is strong and perfect, and can be depended upon to grow when the young tree is cut back to the desired height, thus insuring a sufficient number of shoots from which to select those that are to form the new and permanent head of the tree. In two years on older wood these buds have performed their proper functions in the production of either shoots or leaves and can not be depended upon to put out uniformly. It was found that trees grown the second year in nursery rows had invariably been branched too high to meet the accepted standard of height in that locality, and when these were cut back below the point at which they had been branched, they were almost invariably put out from a bud just above the ground.

In following up this matter of nursery stock further, it was found that there were still other factors to be considered. In almost every apple orchard, even in those in which the general growth had been satisfactorily and fairly uniform, there was found to be a distinct individuality in the trees of the same variety. Regular bearers, erratic bearers, shy bearers. The foliage differed, too. I have seen a Yellow Bellefleur, one out of fifty, carrying rich, green leaves throughout the season, when the foliage of the remainder was brown and withered from the attack of mildew, and this not only for one season, but for several consecutive seasons.

It was claimed at the time that these conditions were the logical results of the indiscriminate cutting of buds for propagating purposes, especially so of cutting buds and scions from nursery stock from young trees that had not had an opportunity to develop any characteristics whatever, either good, bad or indifferent.

If the laws of heredity hold good in the vegetable kingdom, and the history of horticulture will justify us in concluding that they do, the character of resistance of foliage and habits of bearing can be transmitted through the buds. It is well at this point to make the distinction between a type and a character. No amount of care in selection will transmit a type. A type is the result of environment, a character the result of heredity.

In the effort to transmit desirable characters through propagating wood, it is well to remember that the individuality of an apple tree can not be determined by the observations of a single season. It must show persistent good behavior for several seasons, and must be accurately watched and compared with other similar trees before we can obtain a correct estimate of its habits. Many causes tend to produce heavy bearing, high color, or large size for a season or two, but when a tree under average orchard conditions shows that its habits of bearing and health of foliage are stable, then there can be little question about the transmission of its characters through its buds, and the annual crop of buds from such a tree should be worth more money for propagating purposes than the market value of its fruit.

In the consummation of this ideal of having the good habits of the apple trees universal throughout the orchard the initial step must be taken by the planter. He must create the demand for pedigreed stock and must be prepared to pay accordingly. A propagator of apple trees can cut 1,000 buds in the nursery rows in less time that he can ten from an individual tree. In all lines of business, time costs money, but the cost of nursery stock, if the quality is there, should be the least of factors that enter into a long-time investment like an apple orchard.

And now, for especial benefit of those who propose to extend the apple industry into new regions, the lessons drawn from a prolonged study of the apple orchards of Los Angeles County, concerning the laying of the foundation of a commercial apple orchard, may be recapitulated as follows:

Study well the local conditions before selecting the permanent varieties.

Insure fruitfulness in large blocks of one variety of apple trees by planting pollinizers among them.

Look into the origin of the propagating wood used before buying nursery stock.

There is nothing in all of what has just been said that is new. No one knows that better than I do. In apple orcharding, as in every other phase of horticulture, the state of knowledge is far, far in advance of the state of practice. These truths have been set forth time and time again by such masters of the science as Waite, Wickson, Powell, Fletcher, and others. All the good that I could hope to come from this paper lies in the fact that the report of this convention will be widely circulated, and some future planter of a commercial apple orchard may perhaps have his memory refreshed upon these points before he plants his orchard rather than after the loss of many years and much money. (Applause.)

PRESIDENT JEFFREY. I don't feel like allowing Mr. Maskew to belittle his own achievements in this line. While he may not have told us anything new in apple growing, everything that he has told us he has lived himself. He is an apple grower and a student of apple culture, and while he may not have told us anything new, he has told us things that he has realized by actual contact with the apple trees themselves and their environment and everything connected with apple growing. We have heard a gentleman referred to rather indirectly, rather obscurely, in Mr. Maskew's paper. Now we have that gentleman here to present to you his views in person, and it is now time to introduce him. Professor Wickson will please come forward: "Must the Apple Go to the Mountain?" (Applause.)

PROFESSOR WICKSON. *Your Excellency, Mr. Commissioner, Ladies and Gentlemen:* I have swallowed a good deal of this December weather and am not quite sure whether I can make myself understood. However, the paper is very brief, and for that reason I will undertake to read it myself.

MUST THE APPLE GO TO THE MOUNTAIN?

By E. J. WICKSON, of the University of California.

Must, or will the apple go to the mountain? I ask the question without expectation or intention of answering it. It is a very old question. Ever since the apple did so ill in the Garden of Eden, down in the rich valley, and escaped the penalty of its offense upon the summit of Mt. Ararat, mankind has been discussing the question: "At what elevation may the apple be expected to do its best?" At this late day we could, perhaps, ignore the question were it not the fact that never before in the history of the human race has it assumed such great commercial importance as it presents to-day in this newest of all civilized lands, the Pacific coast of the United States. With us it is not merely a question of a few trees or a few hundred trees as an annex to general farming; it concerns itself with the development of important parts of states or even of whole states; of thousands of people, and of millions of dollars. Thus, a very old question now assumes such new phases that it may require years of study and experience to answer it from these new points of view.

Are elevated regions entitled to the distinction which they are now claiming as alone suited to the production of winter apples of the highest finish and beauty, and the most perfect keeping qualities, and will the fruit continue to command the lofty prices which it is now receiving after traversing a quarter to a third of the world's circumference to reach the world's great markets? This is a question involving pomology, commerce, and finance, and in the sciences and arts of these three great branches of human activity favorable demonstrations must come to justify claims which are now being made, in some parts of the coast, that a thousand dollars per acre can be supported as a reasonable valuation for good apple land and five thousand per acre is not unreasonable to claim as the value of a thrifty young bearing orchard. Will all these favorable demonstrations be attained? It would manifestly require the most piercing analytic insight and the most clear and accurate prophetic foresight to submit an answer which could be accepted as conclusive. Nevertheless, it is a question which every commercial apple grower should ponder and upon which he should watch for every ray of light which can be drawn from observation and experience. I have no thought of penetrating the depths of the problem, but rather to indicate a few features of the environment of the question by way of which, perhaps, the ultimate determination may be approached.

It must be conceded that the mountain apple is superior to the valley apple in beauty and finish, in texture and in keeping quality, when it has been well grown under conditions which enable the favoring features of the elevation to do their best work. Taking the apple to the mountain does not imply that the elevation will do the rest. Every principle of good culture and every recourse of protection must be as assiduously applied—possibly even more so—to attain the best commercial results. But this superiority of the maintain apple is not a recent discovery, nor are the conditions which impart it at all restricted to the parts of the coast which are now making greatest claims to them as a distinctive natural endowment. The grand beauty and keeping quality of California mountain apples were demonstrated very soon after the American occupation and before any commercial greatness in our fruit products was thought of. The fact was thrown in the world's eye at the Centennial Exposition in Philadelphia in 1876. A systematic demonstration was made at the New Orleans Exposition of 1885, where apples grown at elevations from two to four thousand feet in different parts of California were shown in June of the following year in competition with the fruit grown in the mountains of Arkansas and Missouri and the few specimens remained in a good show condition, while the fruit upon the competing plates was replaced several times. This test was accidental, in a way, because the California exhibitor had no reserve stock to replace with and was forced to let his first specimens stand up against all comers, and their behavior was a revelation to all beholders. California made the record then for the superior quality of winter apples grown at elevations in a semiarid climate, and the question which has recently arisen as to whether California can grow as good apples as the northern states of the coast which have similar climatic characters should be reversed. Can they grow as good apples of that class as we?

On the commercial side they have passed us, and they have advantages which must not be minimized. They are entitled to credit for the grand achievements they have attained, even if the calculations they are making upon the basis of such achievements should prove exaggerated. They have decided advantages in transportation; they are almost out of sight of us in the important matter of growers' organizations for standardization and handling of fruit as applied to the apple; they are concentrating upon a single fruit and upon a very few best varieties, as we are doing with the orange, but we can not compare with their concentrated and systematic work in connection with any other fruit which we grow. We must do this with all commercial fruits if our production is to be increased. But giving them this credit and thanking them also for the confidence and buoyancy which their distinguished successes will contribute to the spirit and development of all the fruit interests of the coast, we must claim that they have demonstrated nothing distinctive in natural adaptations beyond what California elevations possess. The high valleys of Lake, Mendocino, and Humboldt comprise half a dozen districts like Hood River. The Shasta region has all the variations in altitude and exposure which has eastern Washington from Wenatchee to Walla Walla and from North Yakima to Spokane, and Mt. Shasta is higher and can shake biting breezes from his shoulders which will bring just as bright a red to the cheek of the apple and just as deep a blue to the nose of the grower as any of the northern snow-clads can produce. There are also high valleys in the central region and in the mountains of southern California, where the "warm days and cool nights," which our northern friends are claiming monopoly of, are the regular thing during the growing season and where the winter is marked by heavy rains and snow flurries which are just as cold and wet as theirs. But I fear that running along this line I am almost conceding that the apple must go to the mountain in California, as they claim elsewhere. I am not ready to do that, though I do insist if that be the ultimate decision California will still be in the apple business with two long mountain ranges and several short ones.

It is worthy of note that the present fame of Oregon and Washington in apple growing is no part of the traditionary fame of the Oregon apple which has been handed down from '49 and the spring of '50. The Oregon apple which the California pioneers worshiped and were disposed to give the horticultural birthright of California for a mess of the sauce of it, was not a mountain apple at all. It was grown in the lower levels of the Willamette Valley, and, perhaps, on the lowlands of the Puyallup and in other coast regions adjacent, and its fame came, not from comparison with either California coast or California mountain apples, but with apples grown in the low foothills and near the rivers of the great valley where the first mines were, and where nothing but an early apple for immediate use is worth growing even to this day. When the coast apples of Oregon and California are compared, there may be no particular difference in the fruit perhaps, but California has the coast apple business developed to a volume of prime clean fruit and breadth of trade which have made the State famous, both at the East and abroad. And this California coast valley fruit will always be in demand for distinctive trade and particular markets, perhaps, providing large groups of Californians work together for the development of culture, protection, and marketing, as the people of the Pajaro Valley have done during the last decade. It is likely that they will meet new difficulties as they have met and vanquished the old ones. The new problems will probably include those of a different nature, and they may be largely pomological and commercial. I suggest a few simply to indicate my meaning.

First—The Pajaro Valley bellefleur is a demonstration that an apple which is notable everywhere for being very exacting in requirements for success does find in the Watsonville district conditions which bring the fruit to a degree of perfection which is rarely, if ever, attained elsewhere. It is altogether probable that there are other varieties which will exhibit similar content and display other characters and commercial suitability and attractiveness. The value of the bellefleur was, I presume, demonstrated through the chance planting of it by the pioneer orchardists of the valley. There should be provided in the valley a means for testing out all old varieties which have not been tried, and all promising varieties under competent pomological observation and comparison.

Second—There are other varieties which attain acceptable characters and local desirability in the main, but disclose some defects which limit their value. This may be due to some requirement for full development which the local conditions do not include or to some peculiar behavior of the type which has been thus far prevalent. In either case, the effort to retain the variety but to find a more suitable type should be systematically made. This, too, is a matter for close pomological study and comparison, and it is analogous to the effort which is being made in southern California for the discovery or development of superior types of the Navel orange.

Third—There should be close study made of the relative effects of all cultural operations and all treatments for prevalent pests and diseases upon the thrift of the tree or upon the duration of its effective growing period, or to discover unforseen influences which any cultural or protective policy may exert upon the character of the fruit. Some very startling claims in this line have been recently made in distant places. Whether they are true or not they furnish a suggestion that all cultural operations might be looked into lest they might have some relations to obscure defects of various kinds.

It is not necessary to multiply suggestions of this kind. They are not new. They have been freely discussed by Watsonville growers, both individually and in the Orchardists' Association, and are, I believe, generally approved. I mention them for two purposes: first, to add what emphasis I can to the importance of the work; second, to assure you that such work commands the keenest interest amon the pomologists of the University, and they are eager to coöperat with the growers and with the competent men whom the counties o Santa Cruz and Monterey have already in joint service for the promotion of the apple industry. It is, however, really a State service an should be provided for by the legislature as such. To attain result this work should be amply provided for through a period of man years. Probably your two counties and your liberal individuals an associations have done more for the protection of the apple than al the rest of the State combined, and all the State has benefited by you work. It is time the State took up apple work as a special effort in it own behalf, and this convention should express itself clearly in this lin

As to my first question, then, "Must the apple go to the Mountain?" although I disclaim the ability to finally answer it, I expect a negativ reply for these reasons:

First—Though some apples may have to go to considerable elevation for the best development, other apples both for pomological and commercial development must be grown under the distinctive advantage of the coast valleys. All apple literature and all common experienc show that different varieties of apples require different conditions fo their best development and the trade requires that such special adaptation be discovered and regulate the activities of planters. There i every reason, therefore, to think that there may be apples of ever season of ripening which suit our valleys better than higher elevation anywhere.

Second—The present disposition of apple planters is to grow long keeping winter varieties to secure the manifest advantages of such frui for long distance marketing. This special attention to one phase o apple growing should convey the suggestion that more should be don to develop markets for summer, fall and early winter varieties for al of which California has distinctively adapted districts and can marke such fruit everywhere west of the Rocky Mountains and south of th Arctic Circle, while locally grown apples over this vast area are stil in the bullet or baseball phases of growth. This is a field of productio which must be distributed through the interior valley and foothill and the coast valleys, according to the special growing conditions whic are found in each of these situations. Every advance in the settlemen and development of the wintry districts of the Pacific Slope opens wide the avenues for the employment of the unique advantages of earl growth which a relatively small area of the slope possesses.

Third—Not only the nearer markets, which are thus expanding, bu the more distant countries around the Pacific border, and especially perhaps, those southern regions which will come into neighborly relations with us through the Panama Canal, and along all the currents o transportation which it will set in motion there will be new demand for apples during all the months before the latest keepers mature This is a field in which there will be practically no competition wit California valleys, and no matter what is done with winter apples her or elsewhere, this opportunity will remain open to us. (Applause.)

PRESIDENT JEFFREY. We have some time now for discussio There has been considerable said this afternoon about type, about standardizing apple trees or getting pedigree stock. If that is good doctrin to preach in the apple industry, it is also good in other industries. I would like to have some discussion on that one point, and I would like for Mr. John Markley to come forward and say a few words, if he will, on that point. Mr. Markley is one of the old members of this convention. He was active twenty-five years ago in the work and is active now. I have the pleasure of introducing to you Mr. Markley.

MR. MARKLEY. *Ladies and Gentlemen:* I am afraid I have got myself into a position where I can't do you any good. The horticultural commissioners the other day held a meeting up in my neighborhood, in Sutter County, and, more to fill up than anything else, we brought up the question of the advantages of pedigreed stock, and I gave my personal experiences in pedigreed stock. I said that I found when I went to the race course I was considered a fool if I bet on anything in a trotting race without it had a pedigree; that when a man went to raise hogs he first had a pedigree; in the dairy business was first a pedigree and then the individual animal. In Sonoma County I had a prune orchard and there was one spot of very rich land overflowed with sand which gave it a fine mulch. There were over 100 trees there which would bear from 200 to 400 pounds apiece. There was one tree on the ranch—I had 12,000 trees—that from which for thirteen years I never picked more than 20 pounds a year, whilst others bore all the time. The boys on the ranch called it the bastard. I examined the orchard pretty carefully and I found that I had a great many bastards. After awhile, looking around on the other side, I found I had a few trees and they grew of different shape from the others and bore wonderful crops of prunes. I kept a record of these trees for four years, and if all my orchard had borne as those did I would have had about double the quantity of fruit. The application I wanted to make was, where I live we raise a great many Thompson's Seedless grapes and they are shy bearers sometimes, or very erratic in bearing. About three years ago a man in great pride showed me a vine that had a great many grapes on it, and I kept on looking and he said, "What are you looking for?" I said, "I find nine vines here. Either one of these has as much vigor as this one that has a crop on it and if these vines all over the vineyard had as much on it would make you rich." He said, "I am afraid it might bear them to death." I said, "I don't think it will, but if it does you can afford to let them die." Mr. Frank Swett told me that prior to picking the grapes in his vineyard he went up there with a brush and a paint pot and marked the vines with a stroke up and down that had a large crop on them and the next year he did the same thing and the next year again, just before the picking. He says, "Whenever I have a vine with three marks on it I know it has borne a heavy crop three years in succession. My vineyard will average about six tons and these pedigreed vines about ten." That makes quite a difference. I went there to buy cuttings. He says, "Oh, I have sold all the cuttings." I was buying cuttings for two dollars a thousand; I went there to pay him ten dollars a thousand for his pedigreed cuttings, but I could not get them. He had sold out. I believe it is very beneficial, and I believe that if somebody in this State would start a nursery and grow pedigreed stock and guarantee it, it would do the State a great good; and I don't know why they could not grow pedigreed stock as well as anything else. That is about all I have to say.

PRESIDENT JEFFREY. How are you going to get the vast majority of tree planters to pay the price?

MR. MARKLEY. I don't think it would cost much more. I hav sold trees a little, and I don't know why it would cost me any more t raise a tree from a pedigreed tree than any other.

PRESIDENT JEFFREY. A nurseryman must be paid a price fo that skill. How are you going to get the average grower to support him in that work?

MR. MARKLEY. The average fruit-grower is as intelligent as th average horse-grower. They have been educated up to that. I believ you could educate them up to it. (Applause.)

MR. DARGITZ. Mr. Chairman, I believe that I would like to add a point toward the question that the Chairman has just raised about the expense of getting pedigreed stock in this way. I think the customary price for budding that nurserymen pay the orchardists who cut them for them is something like $2.50 for a thousand buds. Take it for granted that the thousand buds will produce 500 trees—I think it ought to do that—that makes about one half cent per tree per bud. Suppose that for these pedigreed buds the nurseryman had to pay ten dollars per thousand buds; I think he could get them for that, and on the same ratio of production it would make the buds for his trees cost two cents per tree instead of one half cent. The added expense, therefore, is only one and one half cents per tree, and if there is any nurseryman that can't stand an average of one and one half cents for producing trees that will outrank all other nursery trees produced, let him add a cent and a half or even three cents to the price of his trees, and he will have no trouble to sell them, providing he can convince the buyer that he is giving him just this kind of stock. It is a fact that cannot be successfully disputed that in any orchard and any variety of trees, with the same care, from the same nursery and the same time of budding and all, there will be a difference among those trees in the productiveness. There will be also a difference in the quality of the fruit. You will find trees here and there in the orchard that will produce more fruit and better fruit than their neighbors, the other trees alongside of them that have had an equally good chance. Now then if we want to bring up the productiveness of our orchards, doesn't it stand to reason that those trees should be marked just as indicated and that the buds for propagation should be taken from those identica marked trees? If we will do that we will build up the productiveness of our orchards. The same principle prevails exactly that prevails among animals, and where is the man who is going into the stock business to grow cattle or horses or hogs or sheep, if he followed out the hit-and-miss, haphazard manner of selecting his breeding stock that we follow in selecting our stock in planting orchards, would not come to grie very promptly? If he did not he would deserve to. There is no opportunity for success in the stock business unless a man uses exceedingly great care in the selection of his breeders, and there is no reason why we should expect great results, satisfactory results in the development o our orchards and the productiveness of our orchards unless we use th same good common sense in the selection of the buds for the propagation of our trees. It is a point that needs emphasis, and it must have it. (Applause.)

PRESIDENT JEFFREY. I would like to call Mr. Dargitz' attention to the fact that he only spoke of the grafting or budding of the trees. In propagating pedigreed stock you should, perhaps, pay as much attention to the root part of the proposition as to the scion or bud, consequently it would add more than three cents to the expense. Most nurserymen make an ordinary length of seedling root to produce three or four roots for grafting. It is much more expensive to produce a tree on a whole root, which ought to be done if you are going to put a pedigreed top on it. Another thing, the nurseryman, if you deal with a nurseryman, ought to be well paid for the honesty and skill in producing a pedigreed tree, because he is giving you a start that even your grandchildren may enjoy in gathering the fruit from those trees.

MR. DARGITZ. Mr. Chairman, I don't believe that any nurseryman in the State of California would want to come out and openly announce to the public that he was progagating trees, pedigreed or otherwise, from piece roots. I think he would like to have it understood that he is using whole roots and the best roots.

MR. HICKMAN. I would like to say that pedigreed stock is a great thing in every industry, whether it be stock raising or what not. But there is another feature, the place to put the pedigreed stock, which, according to my observation, is very sadly neglected. I can show you, almost within sight of this very building, places where thousands of good trees have been thrown away, simply by planting where they never should have been planted; places that are noted as raising very fine fruit have thrown away something more than half their capital—very much more, and even after the trees are planted, the care they receive is not "pedigreed" care. Even the best of pedigreed stock will starve to death; and, though I am not a horticultural commissioner at present, I may be some time, and I think it should be one of the duties of a horticultural commissioner to protect, so far as it lies in his power, the tree planter from his own ignorance. I have been just as ignorant as others in this. I have paid dearly for my experience. I know what it means to have pedigreed stock. I have seen Newtown trees producing four or five boxes of choice fruit and right beside them trees that would produce ten boxes of worthless fruit, year after year, and, as far as it laid in my power, I have made the changes and used pedigreed scions and so on. But going right through the same orchard, I find there are other conditions besides the pedigree or the stock or the scion that cut fully as great a figure. A year ago we had a very heavy rainstorm, and I, in common with most other unprepared orchardists, found a great many gullies washed in my orchard, and here and there were little ridges of rock, which showed that there were basins that needed draining. I was wondering for some time why certain trees did practically nothing. I can show you trees within fifty feet of each other on the same hill slope, every other condition apparently identical—the trees were identical when taken from the nursery row—and within three years' time one tree is ten times as large as another, not only in one place but in dozens. It is a hill orchard and in sandy land. These are conditions worth looking into, and it seems to me they should be emphasized in the reports of our conventions.

PRESIDENT JEFFREY. What if we could estimate in dollars and cents the millions that have been lost in California by planting poorly pedigreed stock? You would find that the amount of money made altogether in fruit growing has not been nearly as much as the loss in planting in this manner. About 110 years ago a remarkable horse came into Vermont, afterward known as Justin Morgan. For years and years the strain was kept pure, and then it was neglected for fifty or seventy-five years. Now both the United States Government and the State of New York are spending thousands of dollars to restore the purity of the Morgan blood. That ought to be done with horticultural products. If we have a Spitzenburg, let us keep it pure. If we have a bellflower, let us keep it from turning into a grindstone: let us keep it elongated. It ought to be one of the duties of this convention, and every other fruit-growers' convention, to encourage a few nurserymen who are willing to put their capital into this business to raise trees, and instead of paying 15 to 20 cents for a deciduous tree, pays 35 cents for it, and it will be like getting money from home when the orchards come to bear.

MR. BERWICK. Regarding that first paper, you were this morning deploring the misleading statements that go out from California regarding our orchards and vineyards. If I remember rightly, that paper speaks of a very encouraging price of three dollars per box, f. o. b. I don't know if any Watsonville grower expects or gets three dollars a box, f. o. b., or if there be an Oregon grower here who gets, on an average, one season with another, three dollars a box, f. o. b. I think we would like to hear from him. I would like to ask Mr. Rodgers or Mr. Judd what is the average f. o. b. price in Watsonville? Does it approach anything near three dollars a box?

MR. RODGERS. An average would be 90 cents to one dollar a box.

MR. BERWICK. Every season?

MR. RODGERS. Yes, sir. Sometimes it averages 10 or 15 cents more, sometimes a little less, depending on the world's supply.

MR. BERWICK. I believe the price this season in Covent Garden is $2.05 a box—I got a telegram a few days ago. I don't see how they can get three dollars in Oregon when they are sold in Covent Garden for $2.05. There is another point, referring to Professor Wickson's paper. He says, "Will the apple go to the Mountain?" When I think of the Pajaro Valley and the Santa Cruz Mountains I don't think the Pajaro Valley apple will go to the mountain. I have been on the mountains, and I don't even find the Santa Clara prune going to the mountains and making anything but bankruptcy for the growers. (Applause.)

MR. RIXFORD. I would like to ask a question. This discussion has been exceedingly interesting, and I would like to know if there is any one present that can tell us anything about the influence of the stock on the grafting of these pedigreed trees?

PRESIDENT JEFFREY. I can answer very easily, because I am in a position to call out any one to respond. Mr. Femmons is called on for that answer.

MR. FEMMONS. I can't answer from any scientific standpoint, nor can I answer from any economic standpoint; I can only answer from the standpoint of actual observation in the orchard; that is where

I get it from him. In grapevines, strawberries, berries of all kinds, small fruits, we can keep up a pedigreed stock almost absolutely. There are little influences quite frequently that we can not quite overcome, but when it comes to grafting or budding orange trees, for example, there are problems or influences coming in to contend with that are almost insurmountable. Sometimes we will succeed. At other times, under apparently the same identical conditions, as far as we can see, we will fail; why, I am not going to answer. I can give you an illustration. I have done a good deal of top-grafting in my orchard. I started out, away up in the mountains, to try and demonstrate the apples that would succeed there in that location best. I made many mistakes, like a great many other people, and I found it out, but by experimenting I found apples that pleased me, and my idea was, those trees that did not please me, did not produce fruit to satisfy me, to top-graft them, and I chose a few, and my grafting has been by carefully selecting the scions from the trees that pleased me most, that bore the finest fruit, made the finest crops. That far we can go, and when you come to put them into the other stocks, whether it is a small nursery stock or in a bearing tree, we scarcely know what we are going to get, that is, for quality. It is claimed that the stock does not influence the scion to any great extent, but in many cases I know it influences the scion to a very great extent. For instance, I have a neighbor living within three or four miles of me who had one of the earliest orchards in that northern region, early in the sixties. At that time our nurseries had almost every variety that you could get, and, as it happened, there were a great many of the old grindstones planted in that orchard, the American Pippin. After they were thirty years old it was found they were of no value, and he happened to find a very fine strain of the Ben Davis apple. It pleased him—and, by the way, the Ben Davis can grow up in those mountains to perfection. He got some scions and had his trees top-grafted. When they came into bearing they were neither grindstone nor Ben Davis nor anything else; they were a complete blending all over, with the prominent bright stripe of the Ben Davis; they were only medium in size and were perfectly worthless. That was the best illustration of that one thing that I have seen. How we are going to overcome those things I don't know, I don't propose to answer. We have got to contend with those outside influences, and how they come in I leave it to your scientific friends to find out. (Applause.)

MR. NEWCOMB. Mr. Chairman, I would like to say just a word in defense of the Oregon apple grower and the prices they are obtaining. Last year the apple growers at Hood River marketed 300 cars of apples. There were 75 cars, or 25 per cent, that brought these fancy prices—$2.25, $1.75, and $1.50. Mind you, they were the very cream of the crop. We only hear of the best. Portland got all of their inferior apples; they use that for a dumping ground; but by careful selection they do obtain these prices.

MR. HOTLE. The firm of Hunt, Hatch & Co. of San Francisco bought one carload of their fancy apples; they paid $2.25 f. o. b. there, but, as Mr. Newcomb says, they were the best.

PRESIDENT JEFFREY. The average Hood River apple this year brought from $1.45 to $2.15 up to $2.25 per box. I never knew the Ben Davis grew to perfection anywhere, but I will take Mr. Femmons' word for that. Now, with regard to the discussion of stock, that is the most profitable thing we have undertaken here. The presumption is in favor of Mr. Femmons' idea that the root of the tree has very little influence on the quality.

MR. FEMMONS. Often, not always.

PRESIDENT JEFFREY. How can we keep the purity if the root of the apple tree had a very serious influence on the fruit? We would not have any Spitzenburgs for 115 years; the Northern Spy would not retain its individuality, and the Newtown Pippin would not retain its individuality. But the root of an apple tree, of course, or any other tree, will have a great influence on the pedigree and bearing qualities and the appearance of the ripening fruit itself. I don't think it has a great deal of influence on the inherent qualities of the fruit that have been stamped into that Spitzenburg apple over in the old countries, for instance, for hundreds of ages. We don't know how it got there any more than we know how the best horse ever raised on earth appeared in Vermont, how the navel orange ever came to perfection away down in Brazil without anybody knowing where it originated, and I don't believe our scientific men will ever find out, but we ought to bring our discussion to bear upon dragooning some half dozen nurserymen to raise pedigreed trees. In Oregon I have seen the growers in the Rogue River country amputate an apple tree, a Ben Davis, about six inches in diameter, which some of the older orchards had matured, and at the next station above Medford, put in a little scion about as big as your finger, cover it with wax, and in three or four years that was an apple tree as perfect as ever grown from a nursery tree. There is a place where the ability to build up apple trees is certainly remarkable. You could not do that in Los Angeles County; you might in this county, but the Rogue River people and the Hood River people should not have the credit that we get down here, because nature does many things there it does not here. One thing is, it gives them a regular supply of moisture and it throws the leaves off at the proper time, and makes them stay off until the proper time in the spring. You never see apple trees in bloom in the winter, and all those things make it a typical apple country, similar to this section.

MR. MASKEW. I have been trying to make progress along these lines for a great many years. The consensus of opinion seems to be this afternoon that pedigreed stock is desirable. The consensus of opinion seems also to be that it must start with the nurseryman. These are nearly all apple growers here, and I would like to ask, if a man to-morrow desired to purchase from you pedigreed stock, is there a man in this audience would give him a guaranteed pedigree?

MR. FEMMONS. Yes.

MR. BERWICK. What do you call a guaranteed pedigree?

MR. MASKEW. A record of the bearing ability and the fertility for a period of, say, four years—longer, if possible—a record of what that tree had produced and a record of its character. Could any man furnish that and say, "I have got a record of it for four years. This tree has done so and so for four years." How is the nurseryman going to commence this if we don't have the tree for him to draw upon? I have tried to do this for years, and in a small way I have satisfied myself it can be done. To begin with, we must have the trees to get the buds from. Now, Mr. Chairman, if you can devise a ways and means of starting this, it will be a step in advance. We talk this over all the time and every year we have no trees to get them from.

MR. BERWICK. Mr. Chairman, I want to answer that challenge more or less. I have a pear tree over fifty years old, a Winter Nelis pear tree. That tree has averaged half a ton of pears every year for the last fifteen years. I will take $50 a thousand for buds off that tree.

MR. MASKEW. Now, who has a pippin or a bellflower that he can give a pedigree on?

MR. FEMMONS. As I said in my first remarks, and I would like to make it a little more explicit, in answering the question whether I could give the pedigree of stock—and it would be apple stock—I could not give the annual yield, but it is this way. For instance, within the last ten years I have grafted over a hundred trees in my orchard to what is known as the Delicious, and if you will just excuse me one moment I want to make this addition to what I said a moment ago. Many varieties of apples are susceptible of influence from a stock. There are many other varieties that show but very little influence at any time. There are a few varieties, though, that I am sure are very susceptible to it. Now, to come back. I have grafted there a hundred trees to the Delicious. That stock I had from the original tree that grew near Des Moines, in Iowa, and I have grafted every one of my trees from the original tree that I grew at home, which I consider yet to be about as fine as any that I have ever seen. From that one tree I have propagated over a hundred trees. A few out of that hundred, for the past four or five years that I have been watching them, certainly grew superior fruit even to my own original tree. They are brighter in color, they are better in form, they are certainly more juicy and are a finer apple in every way—a few of them there. The most of those trees I can scarcely discover any change in any of their characteristics and yet every tree has its individuality. You can see it in growth, in form of fruit, its character in every way, just as I would come up to any of you and see the character in your face. You can go up to your trees and make neighbors of them, as every one should, take them into your arms, talk to them—well, I got off my subject. Some of those trees propagated from my original Delicious tree are dull in color, they are very elongated, they are poor in quality. The tree the stock was put on seems to be just as vigorous, just as full of life, and why there is that difference I can't tell. That is what I want to get at. As far as nurserymen are concerned, a good conscientious nurseryman that will use every endeavor to propagate the best trees ought to have a dollar for every tree he propagates, and no one ought to begrudge double, treble—aye, ten times the price the nurserymen are getting to-day. It is money in your pocket, and it is the only salvation for California fruit growers, to get down to the very best stock, of every variety, of every kind of fruit that is grown here. With that there can be no possible end to the development.

MR. RIXFORD. Before the gentleman sits down I want to ask him if these young trees that he worked from were all of the same variety—I mean the stocks.

MR. FEMMONS. They were different varieties, some of them York Imperial, and different varieties.

MR. HICKMAN. There are so many problems that the whole session might well be taken up with the consideration of this alone. Mr. Jeffrey mentioned the Northern Spy a while ago and called to mind a row of Northern Spy I have. They have reached their majority. They are twenty-one years old, and no two show the same characteristics. But every year some branches of one or two trees will bear profusely, the other branches will bear nothing. This year there were scattered apples all through and one limb was breaking with apples, and fine Northern Spys, too. And all around the city are such kind of trees as the old gardeners knew. For instance, the Black Detroit is one that is so changed, the Ben Davis, the Baldwin, the White Winter Pearmain and the Bellflower. With the exception of two White Pearmain trees, all the other White Pearmain trees are overladen every year with apples, have to be thinned very greatly. Why those Northern Spys should produce so little fruit is one of the problems that I can't perceive any cause for, because the other trees in the vicinity, none of them, are troubled in that way. Sundry limbs from year to year bore profusely to the point of breaking.

MR. BERWICK. I want to make a confession, gentlemen. I told you the truth but not the whole truth about the Oregon apples. They do fetch a very great price up there sometimes. I was in Covent Garden, London, about five years ago, in the office of Martin, Jacobs & Co., whom you may know, some of you, as being the largest salesmen there, and Mr. Jacobs was comparing for my benefit the sales of the Oregon fruit with the Pajaro Valley fruit, and it did read very much to California's disadvantage. It was a year of poor yield and poor crop in Pajaro Valley and in Monterey County generally, and the figures his clerk read me from their books ran as high as 27 shillings per box for Oregon fruit and only about 13 shillings per box for California fruit; so I believe that some years, for first-class apples, Oregon may get three dollars per box f. o. b. What I object to is that highest figure going out as though it was the average price for the Oregon apple. It is misleading to the Eastern or any other tenderfoot.

PRESIDENT JEFFREY. Is there anything further before we adjourn?

MR. BERWICK. I would like to hear from the Governor. (Applause.)

GOVERNOR GILLETT. I haven't anything more to say than I said this morning, except that I have been exceedingly interested in what I have heard discussed this afternoon. I wish that I could remain with you during the whole convention. It is just such conventions as these that are important to the fruit interests of California, and I know that when men engaged in the business, like you are, meet and discuss these matters, it is going to be for the benefit of the entire State. I thank you for the reception you have given me to-day and regret that I have got to leave to-night, and I wish for this convention every success, and for all others that follow hereafter. It is the growth of our State we are after, the development of our valleys, the increase of our population, and it is the growing of fruit at good prices that is going to cause the prosperity we desire. (Applause.)

A recess was here taken until 8 o'clock P. M.

EVENING SESSION.

PRESIDENT JEFFREY. The first item of the program to-night is the "New Horticultural Law." I will not speak to you very long because I occupied three quarters of an hour of your time to-day, but in order to follow up later in the evening with some very strong expressions on the new horticultural law, it might be profitable to give a little review of this enactment as it now stands on our statute books.

About five or six years ago, perhaps, at the Santa Rosa convention, there seemed to be a desire to reform the county horticultural law. This law, as you all understand, the old law and the new, are optional laws. The plan can not be adopted in any county without the initiative of twenty-five freeholders and fruit growers. At the Santa Rosa convention it was discussed and at every convention following until the present. At one of these conventions, the one preceding the one at Hanford, a committee of fruit growers and commissioners was appointed to recommend a new law. This new law was formulated and presented at the Hanford convention, that is, the convention that was held three years ago, just preceding the assembling of the legislature of 1907. The bill was presented to the proper committees, it was passed through the senate without any opposition and brought to the second reading in the other house. There was supposed to be no opposition to what the fruit growers had prepared when, very suddenly, a telegram came to perhaps the leader on the floor in the assembly to kill this law. I believe it took nine votes to do it, if I remember, the way they had noses counted; at any rate, this single telegram killed the law, as the saying is, as dead as a door nail. The result was that our lower house of the legislature failed to act at all, although the bill had passed the senate, and we supposed it was what the fruit growers wanted and what they were going to get. This left the matter just as it was. By the time another year had rolled around there had been more agitation on this matter, and it resulted in the appointment at Marysville of a committee of five growers. I was authorized, that being the first convention I held, to appoint a committee of five fruit growers and those interested in horticultural matters to formulate a new law. This committee was composed of Mr. Briggs, of the State Board of Trade, of Judge Shields of Sacramento, Mr. Overall of Visalia, Mr. Mills of Riverside, and Mr. A. G. Kendall of San Bernardino, all men deeply interested. The bill was presented in due form. The committee had two meetings at Sacramento; I was made an honorary member of the committee, and we discussed all the principal points of the bill, and it was presented at the last legislature. This time the fruit growers had spoken so clearly on this matter and the reformation of the law was so necessary that there seemed to be no opposition to the law anywhere. We got the bill through the senate without any trouble—it was not in the perfect form that we wanted it, but we got it through, and it stuck in the assembly. While it was sticking in the assembly we soon found the reason. Two men came up from Los Angeles and began to count noses. I was one of the first men they visited in Sacramento, and they said they had the Governor with them, the Governor was opposed to the amendment of the law, and we could not get ten votes in the assembly if it came to a show-down, and one of the assemblymen even threatened the support to the State Horticultural Commissioner's office if the bill was insisted upon. The gentlemen who came up from Los Angeles soon found that public sentiment was so strong against killing the bill again that while they could not possibly prevent the passage of this law, they could so modify it that it would not be acceptable to the committee of five who had formulated the bill. Without making the story any longer, the bill was passed just as Judge Shields had written it, with the exception of one clause, and that was the clause providing for a deputy or two deputy county commissioners to be appointed by the commissioner himself and providing the supervisors were willing to have deputies. Now the law states that there has to be an examination in every county, and that examination is held in the same way that a teacher's examination is held. The Governor, under the provisions of this law, appointed a commission of three examiners, of which Mr. Garey of Los Angeles, Mr. E. B. Collier of Riverside, and Mr. Carnes, of the State Insectary, are the members. This committee has held examinations in Los Angeles, San Bernardino, Riverside, and Orange counties in the south, and in Placer, Nevada, Butte, Yuba, Sutter, Kings, Tulare, and Fresno, in the order in which I have named them, making twelve counties, or one third of the counties in the State, approximately, that now have county horticultural commissioners. These twelve examinations have been held and most of the appointments have been made, or several of them, at least; the supervisors have twenty days after the certificates of examination are received in which to make the appointments. Now they are being made in the different counties. Monday, I think, the Nevada people chose their commissioner.

This is a brief outline of the progress under this new law. It seems to be a vast improvement over the old law. There are horticultural commissioners sitting before me to-night, and whom we hope to hear from later in the evening, and fruit growers on all sides of me, who have seen the defects of the old law. I know counties in the central part of the State here which have excellent men serving as commissioners without any encouragement from the supervisors, with but little encouragement from the fruit growers, serving without pay, to protect their counties from insect pests and diseases. There are other counties in the State where men have sought the office and are holding it just for the honor of being there and having position. There are other counties in the State, especially one or two in the south, or were before they made their changes there, that are holding this office to keep the political machine intact, and so it goes all over the State. We believe now that we have got on a better plane and we will have better results under the new law which places all the responsibility in the hands of one man. In Los Angeles County Mr. Meserve, an old official who has held the office for years and a very capable man, is commissioner. They have appointed two deputy commissioners in that county. In Riverside County Mr. Cundiff has been appointed, in San Bernardino Mr. Pease, in Orange County Mr. Roy Bishop. In San Bernardino County Mr. Pease, a strong republican, an old army veteran—not an old one—has received the appointment under a democratic board of supervisors. Mr. Cundiff, I am sorry to say, is an old-time democrat. He is appointed by the Riverside supervisors who are republican, all but one, four out of five. In Orange County Mr. Bishop told me to-day there were four republicans and one democrat on the board of supervisors. They have appointed Mr. Bishop, a democrat, because he qualified for the office. Now, a democrat can find a bug just as easily as a republican, if he knows how, and he can treat it just as vigorously as a republican, if he knows how, and *vice versa,* and we wonder now why we have stood by this old plan so long. In Los Angeles County the best commissioner the county ever had—I was one myself for six years—was Mr. John Scott, a democrat, serving under the interpretation of the old law that the board of supervisors could appoint one man. Mr. Scott served four years most acceptably and held office under a republican board of five, but that was an accident. As soon as the machine found it out they immediately read the law and saw that the supervisors were obliged to appoint three men and at that time Mr. Scott abdicated. The fruit growers are to blame for allowing this thing to go on so long. Politics ought to be kept out of the office. When I was appointed State Commissioner the understanding was that no politics should be allowed to interfere with the office in any way. The Governor and all his friends have stood by that understanding, and when I went to select my deputies I had nobody to consult but myself. The consequence is I have got four boys, Mr. Bremner, Mr. Maskew, Mr. Moulton and Mr. Carnes, who were appointed solely because of their ability.

There are some troubles coming up to-night to be discussed with regard to the new law. In Yolo County, in Sutter County and in other counties—in one county farther north—there are troubles that will have to be discussed to-night and passed upon.

Now, I am going to quit talking to you within the next minute and give you a chance to listen to Mr. Bremner and others—Mr. Moulton will talk to you—and give you a chance to discuss the troubles that are going to come up under the new law, and when we get ready to go to that point we expect to see a difference of opinion; I hope there will be, because I am not certain myself. Suppose there is only one man passes the examination, which is the case in some of the counties right close to Sacramento; one of the most able men in the county has passed the examination and no other man got through. Under the law he is obliged to be appointed. He will not agree to give up his own private business, perhaps any considerable portion of it, at least, and attend to the county's business. The question will come up whether that man should be appointed unless he will agree to make the county business paramount to his own, and I hope when we get to it we will pass our opinion on that feature of the new law. That is the only puzzling thing now before the State Commissioner. You will see that it is going to be a troublesome matter to handle. Now Mr. Bremner will address you a few moments. (Applause.)

MR. BREMNER. *Mr. Chairman, Ladies and Gentlemen of the Convention:* Perhaps there was something of a joker in this program. It may be the subject of the examination was introduced so as to bring out all the old commissioners, thinking, perhaps, I was going to tip off the examination, that I had some underground telegraphic communication with the examiners, and would tell you all about the questions. I hope I will tell you something that will be a benefit to you in taking the examination, if you are intending to do so, and if you are not intending I hope I may say something that will induce you to take this examination in your county.

There is a reason for the committee who framed this law putting in the clause that there should be an examination that would be a test of the qualification of the men who wished to be prospective commissioners of the counties. I believe that the reason for the qualification clause lies in the commissioners, perhaps, themselves. We know that there have been cases in California where men who have been appointed by the sanction of the growers, perhaps, where they were permitted to present only a very small bill to the board of supervisors, were only allowed to spend a little time, a very few days in each month, perhaps were often asked not to present a bill at all, or were appointed under a guarantee to the board of supervisors that they would not present any bills as horticultural commissioners. Other cases have arisen where commissioners were unqualified. I recall a case where there was a public assemblage and a commissioner of that section was present and, wishing to impress the audience with his knowledge, he reached up on the wall and pulled down a large crane fly. This fly looks like a great big daddy-long-legs with wings. He dangled it in the air and said, "That is the thing that makes the Hessian fly," and he threw it on the floor. Now, of course, the Hessian fly is a very minute fly. A man who does not know the difference between a Hessian fly and a big crane fly would not make a good commissioner, and it was with this idea in view that this examining board have drawn up questions and presented them to the applicants, to draw out whether they are, by their occupation, by their study, by their experience, qualified to not only examine incoming nursery stock in regard to its cleanliness, its freedom from diseases, but also to advise growers intelligently as to the planting and care of their orchards and vineyards. The men who passed this examination prove that the examination is practical, and I think in saying this I am complimenting the Board of Horticultural Examiners, and in complimenting them I am certainly complimenting Mr. Carnes, who is most responsible, I understand, for the questions formulated. When you have considered the matter I think you will agree that the examination is practical, for in Los Angeles County eight men took the examination and five passed. Of the five who passed four of them were either commissioners or ex-commissioners and the other an inspector. In San Bernardino County the man who passed the examination was an ex-commissioner; the man in Riverside County was an ex-commissioner. I might say, also, that I do not believe that any of these commissioners who passed this examination had ever been to any agricultural college and taken a special course in pomology. They proved, however, that they had been keeping pace with the times, that they had been taking horticultural bulletins from the State University, from our own institution, and from the government, and that they had been studying these things; that they were up in the practical knowledge and in the technical knowledge that fitted them for commissioners, and I think it is a compliment to the commissioners of California when we see that these men have been reappointed to their positions. This should be a stimulus to the commissioners who have not yet taken the examinations in their counties, to rub up a little bit and take these examinations; for I believe that any commissioner in California who has been conscientious in his work can pass these examinations as they have been given. I believe that every commissioner should take them; that every inspector should take them; and that representative growers, who have the interest of their counties at heart, should also take them. They should take the examination to see that it is practical, and that the men who pass that examination are qualified to hold the office. The inspectors should take the examination to prove to the commissioners who are going to appoint them that that they have been keeping pace with the times and that they are qualified, for it is on the inspectors of the county that the bulk of the commission work falls.

PRESIDENT JEFFREY. It has been intimated that the fruit growers of California do not understand the county horticultural law. That is a mistake in some cases. In one particular case in which I was officially concerned, after the State had spent $500 or $600 in suppressing a very bad pest in a certain orchard, a pest that scared the citrus growers all over the State nearly into spasms, and the bill had been presented to this man for the work done in suppressing the insect pest, he must have read the horticultural county commissioner law, for he discovered that in that particular county there was no horticultural law. He could buy out every man in this house, I don't care how wealthy you are, and yet he refused to pay that bill. If we had had the officials in that particular county which we will have under the new law, this man would have paid the bill, and we must get commissioners that will do thorough work. Mr. Bremner was telling about its being necessary to be thorough. You must know a bug when you see it. Now, we have Mr. Rodgers of Watsonville, who will take charge of the program for a few moments, and I hope you will support Mr. Rodgers and help him out in his part of this evening's entertainment. (Applause.)

MR. RODGERS. *Mr. Jeffrey, Ladies and Gentlemen:* In picking up the program the other day I was surprised to find my name appearing therein under this head of "Discussion of Topics of Interest to Horticultural Commissioners." A few times in years past I have received a letter from our State Commissioner asking that I contribute something toward the program and hoping that I would not refuse, as they were having difficulty in securing sufficient topics. But not so with Commissioner Jeffrey. The methods employed by him remind me of the methods pursued by an electric lineman. A short time ago I had occasion to stretch some electric wires at my place and called in the services of a lineman, and after getting the wires over the pulley, he pulled for a time without succeeding in getting them tight sufficiently to suit him and called on me and we both pulled, and with our combined strength we still were not able to get the wires sufficiently tight. He said, "Well, now I will have to go and get my come-along." That aroused my curiosity and I waited patiently until he could secure his come-along. In due time he produced it, and it was a little device which he could attach to any sized wire, and by the use of a pulley he pulled the wire until it would vibrate like a fiddle string. Now, I think our Commissioner, when he wishes to make out a program, sits in his office in his easy chair and throws out his come-alongs, and we have to come. Now, taking the cue, I am going to call on a number of the commissioners here to-night for several topics that have been suggested. The first is the better organization of county commissioners. I am going to ask Mr. S. A. Pease of San Bernardino to address us on that topic. (Applause.)

MR. PEASE. *Mr. Chairman, Mr. Rodgers, Ladies and Gentlemen:* I think in the discussion of this subject a good way to get at it would be to go back over some of the old methods that obtained in the early years. Of course, the commission has not come to its present state of efficiency by a single jump. We have gone by slow progress, the way most good things go, and I will just quote some of the shortcomings of the commission as I found it in 1896, when I was first appointed. I had been an inspector for a time and was appointed to the office of horticultural commissioner, and I went to San Bernardino and investigated the doings that had been going on for the seven years previous to this. I found at that time, there being a three-man commission, that they had done as commissioners sometimes did in that day, had divided the county into three separate districts. They were all citrus districts. Each commissioner took his section, a third of the county. I found further that in the operation of the horticultural commission each man used a different method to accomplish his work in the county. Right to start on, that did not appear to me as very good. My idea of the work of the commission was that the commissioner should be posted on his duties and that every part of the county should have the one best method of controlling insect pests and caring for the trees. One of the methods that I found and objected to at that time was that one section of the commission was very arbitrary, and if people got in trees and plants that showed they were not well posted as a commissioner should be posted, and oftentimes, in treating trees that were shipped in, if they had some little pest on them, they treated them with such severity that it killed the trees. Of course, this brought the commission into disrepute and a great many people were against the commission. Another thing they did, they were not particular as to the time of the year. At that time the San Jose scale was pretty bad, I think the whole length of the State, on the deciduous trees, and had to be cared for. They would wait until the trees were almost ready to blossom and then would serve a notice on a man to clean up in ten days, and then perhaps they would wait a month until the trees were in full bloom and go around and find that some of the men had not sprayed their trees, and they would order a man to spray his trees with salt, lime and sulphur and kill the whole crop of fruit. There was no method. The law dictates plainly about how the work shall be done, and yet they used to order their inspectors out and inspect all the nursery stock in the country at their pleasure. If it was deciduous stock and when it was to be taken up the nurseryman would want the root inspected, they would say, "All right; we have inspected the stock once and we will do this at your expense," and charged him, instead of $2.50 a day, as the law required—charged him 40 cents an hour. Well, you can imagine the state of affairs when I went there. They had a paper that was run by an organization. It was called a political paper, and, as was frequently the case, they changed the editor of the paper, and it was customary at that time, after they had gotten the man installed thoroughly, to wind up by saying, "Now, remember one thing; if you ever get short of news you can always jump on to the horticultural commission," and they always proceeded to do so. As matters have progressed, we have found a great many things that needed remedying; we made certain rules for our inspectors. For instance, we told the inspectors that the time to inspect is that time of the year when something is going to follow. That means that the inspector is not to go out and inspect simply for the purpose of drawing his pay, but when he inspects and finds any pest it means that some disinfectant is to follow, either spraying or fumigation. There are a great many things that affect the commission. I speak of these because the method that had been in operation before the time we went on brought the horticultural commission into disrepute. Now we try to systematize everything, and we have helps in every direction; we have the help of the University, we have the help of the State Commission, and about three years ago we applied to the Department of Agriculture, and they have sent a man who is working now in the field for the purpose of systematizing the science of fumigation in order that the work of fumigation may be perfected, that is, that we may get the very best results from fumigation. For instance, it has been customary in some portions of the south, as in our county, for part of the people to employ the county to do the work. The county will follow the methods which have been published in pamphlet form and are available to anybody. Mr. Woglum has not the wide scope of duties that the commission has, but his sole duty is to work on the science of fumigation, that is, to overcome some of the difficulties we have been having and to establish the correct dosage for the different kinds of scales. All of these things are things that a commissioner should know. This year we have been following him closely. We have marked our tents with the Wheeler system, which is the system he has been using. After the trees are marked, by looking at the figures on the tent you can find the exact number of feet over it, and then by using a tape line you get the circumference, and he has a table of figures and that gives you the exact dosage you should use. The reason why the commissioners should know these things is so they may avoid things that bring unnecessary expense to the growers, such as contract fumigation. To explain that, I will mention that in our county we have an ordinance requiring contract fumigators to take out a license to fumigate within the county, and these fumigators are obliged to make a report to the horticultural commission every month. One of the contractors has made two reports, and in this report he has put here the owner's name and the number of trees he has fumigated. Then he puts on the other side the total number of pounds of cyanide that he used in fumigating all those trees. By reducing those pounds to ounces and dividing it by the number of trees it gives the average dosage that he used on trees. The first report that he made showed that he used less than four ounces to the tree, and such men as James Mills, who is trying to do the work correctly, would use six ounces. The effect of that would be, if Mr. Woglum is correct and it takes that dosage to kill a certain kind of scale and a man attempts to kill them with one fourth of the amount, that money is practically thrown away. He leaves the bugs on every tree.

In the working of this new commission the responsibility is put on one man. That man passes an examination to show that he is qualified to do the work of the commissioner, and is held responsible, you might say, for this amount of work. It is also intended to draw the commissions closely together, and we expect the final result will be that the commissioners will all work in more unison, that everybody will use the one best method, and that they will work in conjunction with the State Commissioner of Horticulture; that is, we will be like one body and do the work with no friction or pulling apart. (Applause.)

MR. RODGERS. Mr. Hecke of Yolo County will next address you.

MR. HECKE. *Mr. Chairman, Ladies and Gentlemen:* I have not had the advantage of having been a horticultural commissioner for many years, in fact my appointment only dated from last year, yet at the same time I have attended these horticultural conventions and have followed with great interest the various things that they had to tell before we succeeded in getting our new law passed by the legislature. I think that this new law is decidedly a great advance over the old law. How it is going to work out in the different counties remains to be seen. There is no question in my mind but that in southern California it is exactly the proper thing. Whether it is going to work out to the same full advantage in the north will have to be proven later on, but I think it will.

I have made a few short notes and I would like to speak some about the way of bringing the horticultural commissioners into closer contact with the State Commission. I think that our State Horticultural Commissioner, Mr. Jeffrey, has inaugurated a very good way of bringing these together, and that is, to hold meetings in the different districts, and thus get the growers in direct contact with the State Commission. I think this is a very necessary thing to do for this reason, that so many of the fruit growers do not have the time and have not been educated to attend this State meeting, which occurs only once a year, but by the State Commissioner coming to the different fruit districts and inducing these growers to come to meetings, they will get gradually interested in our work and we can get them to study these questions to better advantage.

We have not had an examination in our county yet, but it is possible that in the next few months an examination will be held there. From what I have heard, I believe this new law provides for all contingencies, and while it does not specifically say that the wheat question shall be examined into. I presume it will be touched upon in the part which says that the horticultural commissioner shall have practical knowledge in pruning and horticultural work.

The fact that the horticultural commissioner must be a resident of the county is a good feature. I think he should be vitally interested in keeping insects or fungus pests out of the county. Furthermore, by being interested in the county, he is not only the scientific bug hunter, but he should also be the friend of the fruit growers, and in making his tours around the country he should consult with them as to the best methods of fighting the various insect pests. For instance, the spraying for peach blight or for apricot fungus, which is practically the same, must be done at the proper time of the year or the results will be very unsatisfactory. In our northern counties the complaint is often made that the spraying is done at the wrong time of the year. Furthermore, since this new law has passed and the relief for the horticultural commissioner has been raised, it will be possible for him to come in much closer contact with the State Horticultural Commissioner. I think the county horticultural commissioner ought to be requested to make, not only a yearly report, but to make his report monthly, and the same monthly report should also be given to the supervisors of his county.

Now, another question which has been touched upon only mildly by our Chairman is the fact that in some of the counties the board of supervisors will be opposed to having a horticultural commissioner working all the time. They will claim that there are some times of the year when it is absolutely necessary that the horticultural commissioner should be at work—for instance, during the time that the orchards should be inspected for pests, or that the different nurseries will ship in their products, and I rather anticipate some difficulties; for instance, in our county, in getting the board of supervisors to let the horticultural commissioner put in all his time at the work. Now, is it practicable to appoint a fruit grower who has the interest of this industry at heart or will it be better to appoint some one else? This I would like to hear a little more about. Mr. Jeffrey mentioned Yolo County, and I do not know just exactly what he had in mind. I am from Yolo County, and I don't know how many growers there are that are going to take this examination. I am going to be one of them, for the simple reason that even if I am not appointed it will be of advantage to me to pass this examination successfully. But, on the other hand, it may be possible that outside of myself there will not be another candidate. Our county does not belong to the great horticultural districts of California, outside of the Winters district and some 600 or 700 acres around Woodland, and there is very little interest manifested in horticulture. The main occupation of our farmers is the raising of grain or dairying, the raising of alfalfa.

PRESIDENT JEFFREY. Mr. Hecke, isn't it a fact that in your county and in Tehama and all those counties the farmers are suffering from weed pests?

MR. HECKE. Yes.

PRESIDENT JEFFREY. Isn't it a fact that the horticultural commissioners are authorized to exterminate weed pests?

MR. HECKE. Yes.

PRESIDENT JEFFREY. Then why isn't your county much interested in the enforcement of the law and why should your supervisors not pay for the services of a man to exterminate weed pests as well as fruit pests? I understand there are 17,000 acres in one farm in Tehama County that has so much thistle in it they have abandoned it and can not even pasture it. Colonel Irish is interested, because he has land on the river and the seed is being thrown into it.

MR. HECKE. The Johnson grass is overrunning one very fertile district. Under this new horticultural law I understand that the horticultural commissioner will have more power than heretofore, and I think under it he will be able to compel the board of supervisors to grant the necessary aid to exterminate the weed.

PRESIDENT JEFFREY. Your county is just as much interested in the horticultural law, being an agricultural county, if you take the weed pest into consideration, as it would be if it was purely a horticultural county.

MR. HECKE. Yes, I believe it is.

PRESIDENT JEFFREY. Then you certainly need a commissioner there to give all his time to the work the same as in any other county.

MR. HECKE. Let us suppose that there is only one candidate who presents himself for examination. Will it be possible for the board of supervisors to go outside and appoint some one else just because this one man will not be able to give his entire time to the horticultural commissionership? Suppose he has not sufficient time at the critical period to attend to it personally, but will have enough time to supervise his deputy or the inspectors; is it in the law that the horticultural commissioner will have to absolutely give every working day during the year, and perhaps his Sundays, to this particular work? I mention this because you referred to it in your address when you commenced.

PRESIDENT JEFFREY. As you seem to be asking me a question, I would like to ask you if the law requires the sheriff to work every day of the year? He is supposed to work every day in the year and transact the business that he is responsible for.

MR. HECKE. Yes.

PRESIDENT JEFFREY. If that takes 365 days, he has got to work that number of days. If it takes a hundred days he gets the same salary. The intent of the horticultural law is that the commissioner should work every day in the year when in his judgment it is necessary; and when you think there are fine orchards in the Sacramento Valley abandoned to-day because of the Johnson grass, it is time we were waking up to the horticultural commission question, exterminate all that grass and all pests, and the law intends him to judge how many days he should put in, and the supervisors should pay the bill. That is my interpretation of the law and the interpretation of men who know much more than I do.

MR. HECKE. Of course, the executive ability of the horticultural commissioners who would be able to look after the various interests counts for a great deal. This question has simply come up because there may be simply one candidate there who is ready to undertake that examination. I thank you.

MR. COSTELLO. Mr. Chairman, the gentleman asked a question, whether after he took the examination it would require an expert. I would like to answer the gentleman.

MR. HECKE. That wasn't exactly the gist of my question. I was just asking whether at a certain time, if he were not able personally to attend to the duties, he could appoint a deputy to attend to certain parts of the business, the same as when Mr. Jeffrey has to go somewhere he requests Mr. Bremner to go for him. There is a question whether a man should be appointed who can not give every day during the year to this particular work. I fully agree with you that after a man passes that examination he should be fully able to attend to this.

MR. COSTELLO. I think the law states that where the applicants take an examination, if they do not find anybody that is qualified, that passes this examination, then it reverts to the board of supervisors to appoint six *bona fide* fruit growers. Out of the six *bona fide* fruit growers they appoint one commissioner. That is the bone and sinew of the county. They trust that one commissioner, and he tries to qualify. Now, for instance, say one man would pass and he is the only man in his county. He wants to be conscientious; he wants to make up his mind whether he would make a good commissioner or not before he takes the office. He may be a man that would harass the fruit growers, throw them into convulsions. I had the same thing this year. A man came along and struck a little insignificant fly and he telegraphed to Sacramento that the *aleyrodes* had appeared. When a commissioner takes an examination he must intend to fulfill that job that he contracts to do. He can't go around trading horses, because it will take all his time, and he will have to keep up with his job.

MR. RODGERS. Pardon me, Mr. Costello. Suppose that we carry out the program as laid out and then we will discuss these matters.

MR. HECKE. Mr. Jeffrey, wouldn't it be a good idea to discuss this question?

PRESIDENT JEFFREY. We are going to, after awhile, and then Mr. Costello and everybody else will have an opportunity.

MR. RODGERS. Mr. R. P. Cundiff, "A More Uniform System of Inspection, Particularly in Regard to Nurseries." (Applause.)

MR. CUNDIFF. *Mr. Chairman, Ladies and Gentlemen:* I was certainly very much entertained and instructed with our very splendid program this afternoon, and came here hoping that I would not be called upon to attempt to address these people upon any subject, and late this afternoon I had an intimation I would be called upon to say something in regard to this question—a more uniform system of inspection. If we consider the vast amount of damage that the horticultural and agricultural interests of this country sustain every year from insect pests and diseases, and the further fact that the transmission of nursery stock from one section to another is perhaps the greatest factor in that dissemination, I think the subject that has been assigned to me would cover a great deal more time than I would feel like giving it this evening. I do not know whether this is supposed to apply to nursery stock at its final point of destination or at the point of embarkation or where it is shipped from. However, I think that the nursery stock should be inspected carefully at both points, in the nursery or before it is shipped, and again at the final point of destination, and by the most expert men that we can get, men who are perfectly familiar with the different diseases and pests that they are liable to come in contact with in examining this stock. It is a habit or custom in this State—I believe it is not obligatory by any State law; it is simply a matter of county ordinances—that the shipments of nursery stock all over this State are usually inspected and accompanied by the horticultural officer's certificate at the point where it was examined. To reëxamine it at the point of final destination does not imply any criticism of the ability, integrity or honesty of the man who inspected it in the first place. It may be that this stock has traveled a considerable distance, consumed a considerable time, and that there were insect pests in the egg form or embryo form that it would be almost impossible for any inspector to detect, that would develop in a form that would be, perhaps, easy to detect them at the point of final destination or before they were planted out.

I think I need but refer to the fact of the benefits of careful inspection of nursery stock and the work that has been done for years by our State Commission. I think I am right in saying that not a single pest in the State of California that we have to-day has been introduced since the quarantine office was established at the port of San Francisco. Am I right in that, Mr. Jeffrey?

PRESIDENT JEFFREY. I think so.

MR. CUNDIFF. The only case is the introduction of the white fly. That, as you know, broke out three years ago in three separate places in this State, and be it said to the credit of the State Horticultural Commission that there is not a case on record in any of the works on entomology where a pest that was once established was ever eradicated in the manner that this was. I understand that the pest has been absolutely eradicated, or that they have been unable to discover any in any of those three places, Oroville, Marysville, Bakersfield. The pests we have in California were nearly all of them introduced pests—that is, I am speaking of insect pests—and quite a good many of the diseases, that came to us mostly in the form of nursery stock in the early days before there was any legislation on the subject. In fact, California is the pioneer, so far as I know, in beginning the inspection of nursery stock as a method of protecting horticultural interests. I don't think there was ever any organized system in any other State until it was inaugurated in this State. If the system that we now have could have been inaugurated thirty years before it was, perhaps four fifths—yes, I dare say, nine tenths—of the pests that are to-day costing many thousands of dollars all over this State, and especially in our citrus districts, could have been kept out of here. If one half of them could have been kept out it would have paid the expenses of the State Horticultural Commission for five hundred years, but, of course, that is past history. We try to profit by the mistakes made in the past. The pests that we have in the State were pretty well established before any horticultural law was enacted. The value of a system of inspection is that it prevents insect pests being carried in in their county shipments. The closer that is done the better it is done, the less trouble we will have from one county to another. Take the county I live in. We have other counties adjoining us. They have certain kinds of scale pests and mites that affect citrus stock that we have not in our county. We simply examine everything coming into the county, and there are certain pests that we do not allow stock to come in from sections that are liable to have those pests. Purple scale is one of the worst pests in the citrus district. We do not allow it to come into Riverside County. If stock comes in from a district known to be affected by purple scale, acting under an ordinance, we simply give the shipper twenty-four hours to remove it from the county. If at the end of that time it has not been removed from the depot or express office, we take it out and destroy it. We have in that way kept our county free. I think San Bernardino has pursued the same policy and is free from the pest, although all the counties around us have it. I might say the same of a number of other pests, they have simply been kept out by careful inspection. Many counties have pests that the adjoining county has not at all. There isn't any reason why the adjoining county should be visited by a misfortune that some other county has met. It can only be done by inspecting the nursery stock and looking carefully after it.

Speaking of the inspection of nursery stock reminds me of the subject that was very prominently before the meeting this afternoon and discussed very ably and entertainingly by so many of our growers here, and that is the standardization of fruits. The inspection of nursery stock is so closely interwoven with that subject that if we had time we would like to discuss that matter. We frequently pass nursery stock that I am ashamed to pass in our county, not only citrus but deciduous of all kinds. Unless we can find insect pests or evident disease we have to pass it, but it frequently is absolutely worthless. It comes without proper root form, gnarled, crooked, and a grower that is unfortunately enough to put that out will never reap any profit on it. I don't think it would be necessary to legislate, but I think the nurseryman and the grower could get together and that we could soon eliminate any such thing as seconds in nursery stock. A gentleman came to me a couple of weeks ago, a newcomer, and he had bought a tract of land and expected to put out a citrus orchard; I think it was something like ninety acres. He said, "I have two propositions on setting out my new purchase." He gave me the name of the nurseryman and the locality. He spoke of one which he called seconds, three quarters of an inch through at so many inches from the ground. The other was his first class and measured an inch to an inch and a quarter. The price of one was 90 cents and the other $1.25. I said, "You had better pay two dollars and get first class than take the others at nothing. When you take into consideration that it will take six to seven years to bring even the best stock into profitable bearing, it will take double that length of time to bring inferior stock, and you will never get the benefit of it. It will cost you just as much for an orchard with inferior stock." I think when we come to standardizing or improving the quality of our fruit it must start right with the nursery. I believe that is the place to start. (Applause.)

MR. RODGERS. I am going to ask Mr. Dudley Moulton, quarantine officer of our State, located at San Francisco, to address us on the better interpretation of our quarantine laws.

MR. MOULTON. I will speak for just a few minutes on what I think is the best interpretation of our quarantine laws. You understand, of course, that the object of quarantine is to keep out from the State injurious insects or pests and to keep injurious pests from being transferred from one county to the other. The work of keeping injurious forms out of California comes directly to our State quarantine office through shipments of stock from the East directly to the county commissioners, so that it very often happens that the county commissioner is to act almost as the State quarantine officer would, and for that reason it is very important that he be well informed on what insects might be introduced that would be injurious. It has been said that if a man were to begin when he was a boy and give five minutes every day and night of his life to the study of a single insect, he would die without having studied but a very small per cent of the insects that are in existence. This simply emphasizes the fact that the field of entomology is a very large one, and even when we are specially trained or give up the most of our time to entomology we can not be informed on all the insects that might be introduced, which would make it a very hard matter for a local inspector, a county inspector, to know every insect that comes into the county. In a number of cases I think the county commissioner will find that if he does not know the insect he may find on nursery trees or fruits or cuttings, he will have to refer it, probably, to some one else. In San Francisco we find that most of our stocks of fruits and trees that we have to deal with come from across the water by boat, and they come in the shape of fruits, as pineapples and bananas shipped in crates or express shipments or in hand plants. I think, perhaps, one of the most important phases of our work in San Francisco is to watch the hand plants or small lots of fruit that come in through the passengers. As an illustration of this, about a month ago a gentleman brought in half a dozen, or quite a few—there were a dozen plants in the shipment, and on the under side of two or three of the leaves on one plant—there must have been three dozen leaves on the plant, but on the under side of two or three there was a little colony of thrips, adults, both male and female, and the larvæ, a full family. That could very easily have been passed over and it would have established itself wherever the plant went, and if it happened that the insect took more favorably to other plants, it might easily have become a serious pest. The same is true of scale insects and some of the larger insects, such as katydids or grasshoppers, that may lay their eggs inside of the plants; you may have cuttings and the eggs will be placed down inside of the plants so there is no mark placed on the outside; they could be very easily passed there, and unless the inspector is quite well acquainted with the different groups of insects and their habits of depositing and habits of hiding, it will be quite easy to pass them over. The quarantine of insects within the State is also a very important matter. Just last week I returned from a trip through the Porterville, Lindsay, and Exeter orange section, on the advice of Mr. Jeffrey especially. It was thought that the orchards in that district were free from certain scale insects, the red, the yellow, the purple, and the black scales, and we know that almost any one of these forms or all of them are common throughout the orange sections in the south. After looking over the field I found that it was true that the insects were not there, and the people of Porterville and the whole section there are entitled to protection against these insects that might be introduced on nursery stock from the southern part of the State, or from any part of the State or from without the State. The point is a very important one just now to the Tulare County orchardists.

PRESIDENT JEFFREY. I would like to emphasize one thing that Mr. Moulton said about knowing pests. He went down to Tulare County at my request the other day. There has been a long dispute down there about whether Katy did or Katy didn't. He is going to bring you some oranges to-morrow to show you that Katy did. He will show you oranges with great holes cut out of them, and they have got a katydid brand there, where they separate thousands of oranges and call them the katydid brand, because the katydid ate a little spot out when it was as big as your thumb and now it is a blemish as big as a quarter. Now, Mr. Moulton, or any good entomologist, could see those oranges and tell those people just what had done that damage. This is the reason that entomology is valuable, this is the reason your horticultural commissioners should know those things. Mr. Moulton has told those people what has been doing this. The thrips is working on the oranges also, and Mr. Moulton will show you to-morrow the difference between the work of thrips and katydids.

MR. HICKMAN. Mr. Chairman, you spoke of the thistle in connection with your remarks to Mr. Hecke and speaking of that as something the horticultural commissioner should look after. It probably is hardly second to that of the entomological feature. It was my fortune some twenty-nine years ago to find a single plant in the Salinas Valley. That plant I know has spread down the river into the slough and the afternoon winds blew it up to the mountains. That is making a vast deal of trouble. I know one man in particular that it has cost several thousand dollars. I suggested to him that he pull it up but he paid no attention to it. In three or four years the plant had taken the land. His pasture field is no good. He plowed it up; the rains came. You know the result. That field now is several fields. That same thing took place within five miles of where we are sitting now this last year. It cost the county thousands of dollars to clear its roads. In that same neighborhood in one particular place it had caused an erosion or washing out of the hillside, that you could drop this whole building in. I noticed one field thirty-six years ago near San Juan where a stream had brought down its detritus. I noticed that field every year was plowed and never raked. When it came to raking it they could not drive a horse through it because of the needles on the thistles, until two years ago that particular piece was cut up and put in the hands of a gardener. That piece had always cost a great deal and returned nothing. This last spring, in passing through a man's orchard, he said, "I can't kill that thing out." I said, "Why?" He said, "It always grows as fast as I try to get rid of it and I plow before it goes to seed, when it isn't in blossom." I picked up one and showed him that it was already practically in seed and he had been really sowing the seed of that plant every time he cultivated it.

Now, on the heavy lands of the Pajaro Valley this year, you notice a plant that looks a good deal like lettuce. The plant in itself is perfectly harmless—that is, as regards any objectionable feature, but the thing produces a seed and the more you undertake to cultivate it at certain times the worse you spread it, and that thing takes the whole field. There is only one way to do and that is to summer-fallow the land or put in summer crop and keep it there a while.

As regards the thistle, every orchardist and every school child should know that plant. The department at Washington sends out publications that illustrate it so that any one that is used to recognizing things from illustration would know it. I did. In the alfalfa seed I planted I found the plant. I mowed the field, burned it, plowed it up; everything that came up was cut and burned again, and so for three years. That was the only thing that saved that particular case from spreading. I might go on for hours with illustrations of this particular work. Another thing. Last Saturday night we had quite a heavy rain and yesterday, in passing a neighbor's place, I saw that that rain had washed off the whole surface of the ground for about twelve feet wide as deep as he had plowed it. He had no business to plow the swale, in the first place; in the next place he should have protected it. Somebody ought to put a stop to it; there should be no such thing as a man plowing up the natural waterways on the hillsides. They should have a grass of some kind that would hold the soil, for a cover crop.

In connection with this, I passed to-day, coming in, a plant that has been sold for years by florists as alibeya. I noticed in Riverside they had it between the sidewalks and the curbstone. It looked like white clover. A friend called my attention to it in his yard and I said, "Step out here on the hillside and you will see it growing." Wherever the land is moist enough that thing will hold your land, and you can get all the pieces you want from several people here. There are thousands of such things that are of interest, not only to orchardists, but to the public generally. It is one side of the forestry subject. It is worth while for every horticultural commissioner to be pretty well posted in that.

MR. COSTELLO. If I am in order I would like to finish my discussion of the subject on which I started to speak. I think it is of great interest to all of us, because I intend to take that examination myself, and I was trying to tell the gentleman that I thought a horticultural commissioner, after he had passed the examination, should devote his whole time to that office. I don't think he could very well sell goods or keep books for a company and still be a good horticultural commissioner, because I find that it takes all his time, and more, too, than he has studying up those different fungicides that come. In northern San Joaquin many people would say, "Why don't you let your inspectors go? The thing is over; there is nothing more to do." Sure enough, the battle is over, and when the battle is over they always put out a sentry to keep guard to see that nothing comes in. When a commissioner qualifies and just devotes a little bit of time to it there is nothing more to it, because the people say, "Oh, he don't care; he is just drawing his money and he is working selling beans down on the dock." Maybe is out to the race track running races with his horses. So, you must be a commissioner. If you are going to take that office, you must make up your mind that you must tie yourself down. If you have got the thousand dollars you can put it up yourself. But I haven't got the thousand dollars to put up. I have got to go to some of my friends and they must put up a thousand dollars that I will come through. Suppose I was down to Emeryville running horses; they would say, "That fellow don't know sic'em; he is just drawing his money." So it must be that a commissioner must get right into the collar and get right down to business. I have been at it about four months now studying night and day, and it is a pretty stiff proposition to be a commissioner, I find, and I haven't got started yet.

PRESIDENT JEFFREY. I would like to say one word of warning. There is a lippia in the Sacramento Valley that is becoming one of the worst weed pests in the valley. It is taking the pasture lands, crowding out other vegetation and the farmers are alarmed over the lippia, not the *Lippia repens*, but there is another that is almost identical in characteristics. We must remember that if our horticultural commissioners do not stand between the people and these losses, there is going to be an abandonment of thousands of acres of the best farming land in the State, especially from the Johnson grass and the lippia and the Russian thistle and the Napa thistle, particularly in counties where farming operations are carried on largely. We ought to impress the growers and the officials that the agricultural interests of the State are just as much in danger and are suffering just as severely from weed pests as the horticultural interests are suffering from insect pests. Let us make that a part of our declarations by resolution, Mr. Kellogg, and then the supervisors, if they represent farming districts, will be willing to put up the money.

MR. HICKMAN. I will say, in regard to that *Lippia repens*, that just east of Gilroy the plant has been, to my knowledge, since 1873, and it has never spread into the fields. You probably know that the *Lippia repens* does not spread. Here, all the way around the waterways, from the bridge a mile and a half up, I noticed to-day the only place where it showed any disposition to spread was behind Mr. Allison's house, and there it does not spread beyond the wet ground. It also is a good feed.

MR. RODGERS. As this is devoted to topics of interest to commissioners, I have here what purports to be a copy of the horticultural law, and if our worthy Commissioner will take the Chair, there are a few things I wish to bring out concerning it. I believe the enactment of this new law is a step forward, from the fact that we will have better men in office, more profound in the specialties required of them, but it seems to me there are some discrepancies and shortcomings that should be corrected, and as long as we have started along that line I think it would be well to bring the matter up at this time and have it threshed out, either at this time or the next convention, and taken up in due time before the legislature. There are several little points. I notice here in section 2322*b*: "The State Commissioner of Horticulture may issue commissions as quarantine guardians to said county horticultural commissioner and to the local inspectors appointed by him." It seems he has no power, according to this, of making a quarantine guardian of these deputy commissioners. Again, I fail to find here what the duties of a deputy commissioner are; they are not prescribed. There are two points which, it seems to me, should be rectified. Then, a little further down, it states: "The said quarantine guardians, local inspectors, or said county horticultural commissioner, have full authority to enter into any orchard, nursery, place or places where trees or plants are kept and offered for sale or otherwise, or any house, storeroom, salesroom, depot, or any other such place in their jurisdiction, to inspect the same, or any part thereof." Nothing said about the deputy being permitted to go into those places. I presume, of course, we assume that he has that right, but in case of a contest you know lawyers like these little technicalities, and it seems to me it would be very little difficulty to rectify these matters so as to make it clear and concise.

In section 2322*e* it is said: "It is the duty of the county horticultural commissioner to keep a record of his official doings, and make a monthly report to the board of supervisors." Why should he make a report to the board of supervisors? What does the average board of supervisors know or care about the doings of the commissioner? If he should make a monthly report to anybody, I think it should be to the State Commissioner of Horticulture. Then, I fail to see also where he is permitted, according to the law, to buy any stationery, stamps, etc., to be used in correspondence, nor is he permitted, according to this, to make any publications to his people as to what he is doing. The commission in this county has carried on really most of its work through the Orchardists' Association and by publications. This county has been at very little expense as far as the commission is concerned. That was one of the first points brought up when the commission was organized, that no one should ever set up the claim that the commission was of any great expense to the county. I will say that the newspapers, at all times, have had their columns open to the commissioners. By organizing we have had the support and backing of the people, but we have not been permitted, according to the law, to go to the expense of anything. Now, again. There are no appropriations under this law whereby a commissioner can carry on experiments or investigations. We might take the best man obtainable and his hands are tied. All he can do is to look at an orchard and say, "You go and clean that up." It does not seem that he is even authorized to tell the man how to do it. The supposition is that he will tell him what to do. I say that any man who is competent under this new law to fill the office is competent to carry on experiments to see if he can devise ways and means whereby he can cheapen remedies or take a short cut towards the extermination of insects or find new processes. Now, to illustrate, in our own county. We were up against the codling moth a few years ago. We sent for bulletins from the State University and to the Horticultural Commission for information as to how to handle the codling moth. They sent down their bulletins, and in every case it said, "Use Paris green every two weeks, about sixteen times during the season." They used Paris green, and the consequence was it burned the foliage, and if we had not taken this matter up and gone at it and had a thorough investigation made and tests made, the codling moth would have destroyed our orchard industry. The University, of course, did most of the work, but we had to stand a portion of the expense, and after calling on the University and after they had solved the problem, we saw fit to retain one of their men. We became ashamed of ourselves, calling on the University for four years. They solved the problem and showed us the remedy. They showed that by using a good brand of arsenate of lead we could control the insect and there would be no damage to the foliage. We were not satisfied. We wanted to find out how few times we could spray and how small an amount of material we could use in the application and get good results. We have this man still at work, and he is still striving to cheapen the method of eradicating these pests. And I say that there should be a provision in the law whereby the supervisors would have the power to set aside a sum for the use of the commissioners. I think those points should be carefully considered.

MR. KELLOGG. Will you please give the points to-morrow, where you would recommend the amendment of the law, to the Committee on Resolutions, either to Mr. Judd or myself?

MR. BISHOP. As to the report to the supervisors, this is a per diem job and not a salary job, and they want you to make the monthly report so they can know how many days you worked and what you did. Furthermore, I don't believe the commissioner has time to carry on any extensive experiment. His office, according to my notion, should be a source of information, and if he does not have it he should get it from some other source and that our experiment station should do most of the experiments. The board of supervisors, if they see fit, can allow the commissioner money from the general fund, if he can demonstrate to the supervisors that he can by experimenting find something that will be beneficial to the agricultural interests, and if the agricultural people back him up the supervisors can not object. I don't view the office of horticultural commissioner as an inspector of insects or fungus diseases altogether, because they have asked us about soil culture, and I have spent as much time in studying soil and soil chemistry—twice as much time as I did studying insects, and I think the beet grower or the wheat grower has as much claim on us as the man who raises oranges or apples, and if he wants information and we can find it, it is our duty to write to some one and find out the information that he desires.

PRESIDENT JEFFREY. A great deal of the objection Mr. Rodgers has made to-night seems reasonable and it would be held as a vital defect only for this fact, that the law requiring the appointment of horticultural guardians throughout the State has been nullified by the horticultural law of 1903, under which I am acting. This particular part of the law was left in by accident, but it is not a defect if you read it in connection with the State law. Because now no quarantine is possible in the State without an order from my office, countersigned by the Governor. If you had quarantine officers like we formerly had, they would have to get an order from me, countersigned by the Governor, consequently the law requiring the appointment of quarantine guardians has been nullified by the enactment of the law of 1903, which provides another way of quarantining.

MR. COSTELLO. In explaining one portion of the gentleman's argument in regard to the law, why the supervisors want a written statement is that in case the grand jury of each county wants a statement it finds from that statement what the commissioner or the inspectors are doing. Sometimes a complaint may be made that the inspectors or commissioners are not doing their duty, and the grand jury gets to work and digs up those documents and they find out that the inspectors and commissioners are doing their duty and they have been paid according to law. If there were no bills to present the people would go after the grand jury and call them grafters.

The convention here took an adjournment until to-morrow at 9.30 o'clock A. M.

SECOND DAY.

WATSONVILLE, Cal., December 8, 1909.

President Jeffrey called the convention to order at 9.30 o'clock A. M.

PRESIDENT JEFFREY. The first paper on the program this morning is "The Almond Commercially Considered," by Mr. J. P. Dargitz of Acampo. Mr. Dargitz is a practical almond grower. (Applause.)

MR. DARGITZ. *Mr. Chairman, Ladies and Gentlemen:* When I consider the desk where I stand and the thoughts that are promulgated from here and my past relation with the people who worship here and the people with whom they affiliate, it seems perfectly proper that I should take a text this morning and I am going to do so. Genesis xliii, 11: "Take of the best fruits in the land, balm, spices, myrrh and almonds." Jeremiah i, 11: "Moreover, the word of the Lord came unto me, saying, 'Jeremiah, what seest thou?' and I said, 'I see a rod of an almond tree.' Then said the Lord unto me, 'Thou hast well seen.'" It seems to me we have got a good starting point now.

THE ALMOND COMMERCIALLY CONSIDERED.

By J. P. DARGITZ, Acampo, Cal.

The almond is by no means a new nut, and perhaps justifies the old saying, "there is nothing new under the sun." More than four thousand years ago Jacob made use of it in his efforts to achieve commercial success, though in a different way from that which we have in mind to-day. Later in his life the same Jacob, chastened by his experiences, classed the almond as among the choicest fruits in the land. We are not told whether it was a hardshell or a papershell, a Nonpareil or a Texas Prolific.

It was from an almond tree that Moses cut the rod which became a serpent when he cast it down. May we get a lesson from this to the effect that we should not look with indifference on this nut-bearing tree, whose beautiful blossoms furnished the divine pattern for the bowls of the candlestick in the Jewish tabernacle? The prophet Jeremiah was also commended by the Lord of heaven and earth for seeing a rod of an almond tree.

The bringing of almond trees from Europe to California as early as 1853 had about as much religious significance as anything else brought here in that early day. It was soon discovered that even "Sunny California" would not produce almonds in every nook and corner. This, like most of our horticultural successes, came about by lessons of bitter experience, whenever we have proceeded without due consideration. However, we have learned, little by little, until the almond crop of this State now aggregates over half a million dollars annually, and there is no good reason in the world why it should not equal three million dollars, as the people of the United States consume that quantity now. That the consumption of this excellent nut is increasing in the United States is shown by the fact that while in 1907 the consumption was 7,900 tons, in 1908 it was 11,200 tons, a clear gain of over 40 per cent in one year. When it is understood that over 75 per cent of this consumption is imported from Europe, and that the area for the home production of this nut is practically limited to California, and a very small portion of the State at that, we will hardly need to think of overproduction for a lifetime at least. In fact, I doubt if we will ever be able to keep up with the growing consumption. Therefore, in view of the viticultural situation and the great influx of population and development of our resources, is it not worth while to look seriously into the commercial possibilities of the almond?

The almond is such an early bloomer, such a shy bearer in some varieties and locations, and such a "sensitive plant" with regard to bearing, that I would emphatically advise all who anticipate starting in almond production to gain all possible information from the experiences of the past, and especially as to the behavior of the various varieties in the locality which you have under consideration. If there has been no proving in such locality, then get all your information and begin slowly and prove the varieties for yourself. Of course, if you plant an almond orchard, and it does not prove a success, your effort has not been entirely lost, for you can profitably work your trees over to other varieties of fruits. You can change varieties of the almond by grafting or budding, or you can work plums and prunes on them very profitably. The writer's brand of sugar and giant prunes, which has won high standing among the trade in the East, has been achieved with fruit grown on almond trees worked over to prunes after they were fifteen years old. In this connection I would especially advise the reading of E. J. Wickson's book, "California Fruits and How to Grow Them." In this you will find very much that is helpful in getting your starting points.

CLIMATE.

In the matter of climate you must consider both frosts and a tendency to continued wet weather at blooming time. I am satisfied that crops are as often lost by wet weather during blooming time as by frost. It takes sunny weather in blooming time to ripen pollen. Note the odor of honey and perfume in the orchard when the trees are in bloom, if it is sunny, as against the lack of such evidence on a cloudy or rainy day. Moderate frosts in winter while the trees are dormant, or even when they begin blooming, does not always presage damage. But there should be no late spring frosts. Bear in mind that the almond is the earliest bloomer of all our fruits.

LOCATION.

A sheltered location where there is a ravine, or some lower ground close by, which may draw off the cold air after night, in a usually frostless situation would be ideal. The crop does well even in low altitudes (our orchards being only seventy-five feet above sea level), while there are some young orchards on Paradise Ridge, in Butte County, at an elevation of 1,700 feet which are doing well. They have a deep ravine on either side of the ridge which draws off the cold air so that ripe stawberries may be picked from the field at Christmas time.

Portions of Butte, Colusa, Lake, Yolo, Solano, San Joaquin, Contra Costa, and Sutter counties have been proven for almond growing.

SOILS.

The almond likes a deep, rich, sandy loam soil. It should be deep and well drained, because this tree will not endure wet feet much better than the peach. The soil should be rich, for the tree is a ravenous feeder. It must have plenty of soil moisture, as it is the earliest to begin work in the spring and the last to take its annual vacation in the autumn; and to make good strong fruit buds for the succeeding year the tree should hold its leaves well into November. It can not do this without good moisture conditions continuously throughout the season.

VARIETIES.

Perhaps there is no point in the whole proceeding wherein greater care is necessary than in the proper selection of varieties. Everything else may be very good, but if you have the wrong variety you will likely wait in vain for your commercial success. It is utterly impossible to give the one best variety for all sections, because it is not at all likely that any one variety will do equally well in all localities. If you are greatly in doubt get some budding sticks of the variety you are considering and bud them on one of the proper trees in your neighborhood. In two years, certainly in three years, you will have the beginning of your proof. However, no one should emphasize the qualities of any nut or fruit by one or two years' proving. It should require ten or a dozen years proving before speaking out with authority. If this plan were generally followed we should not have so many disappointed orchardists. Usually, when a man finds a new fruit which has extraordinary quality, he forthwith begins to herald it and people begin to plant, yet it might be such a shy bearer or poor keeper as to prove a commercial failure, no matter how excellent the fruit might be.

The original almond was no doubt a hardshell. In fact, we know of nothing like the papershell nut until in recent years, and I doubt if one in five of the population of the United States even now have ever seen a papershell almond. Whenever any animal or vegetable product is bred very highly for quality, it is apt to be lacking in quantity when it comes to reproduction or propagation. So with the almond. The papershell is largely deficient in pollen. So sure am I of this that I would not think of planting a block with all papershells, no matter how much the varieties might be mixed. It has been customary to plant an occasional seedling or bitter almond in the orchard so as to furnish the necessary pollen; but we now have varieties of the sweet softshell which answer the requirements and are profitable.

My first and great reliance is on the Texas Prolific. I am planting it solid, and am also alternating it with other varieties, for the benefit of the other varieties, however. It blooms later by two weeks than any other variety that I know of, tree grows well and bears every year. Trees now twenty years old have born seventeen consecutive crops. I would also plant Nonpareil and Drake's Seedling, alternating either variety with Texas Prolific every two rows. It is easier harvesting if two rows of a kind are planted together. The Nonpareil ripens early and can be gathered before the other varieties are ready. Then comes the Drake's Seedling about three weeks later. The Texas Prolific comes along about two weeks later than the Drakes, all of which is a great advantage if you have a large acreage. These are the three proven successful commercial varieties in our locality. Whether they will do so in your locality I can't say, but on general principles they should, and are worthy a trial. In Yolo County the Peerless is a great favorite. In some localities the I X L is said to be a good bearer. If so, it is a good nut to plant *there*, because it is a good nut and will not meet with much competition from other localities.

PLANTING.

Secure the best trees you can get. It is poor policy to plant an inferior tree because it is cheap. There is great opportunity for some one to become a benefactor of mankind by developing superior strains of the best varieties of nuts as well as other kinds of fruits. It is a fact that there are some trees in every orchard no matter what the parentage, which grow better and bear better than others growing by their side and of the same parentage. I am sure that this will be found to be true in fruit trees as it is in the animal kingdom, yet how utterly indifferent we have all been on this great point which means so much on the commercial side of our work! In good soils, where the growth of the tree will be vigorous, 25 by 25 feet is plenty close to plant. When the trees are twenty years old their branches will touch, and they will need room for twenty or thirty years more.

PRUNING.

The first three years you will need to shape your tree. After that you will only need to remove water sprouts and an occasional cross limb, until your trees get very large, when you will need to cut out some of the big wood and open up the trees. Mr. Adams, my neighbor, says "Prune so a bird can fly through the tree," and he is about right. The tree requires much less pruing than a peach tree. With the peach tree we prune to lessen the pieces of fruit, but with the almond tree we want to increase the pieces in number. I never knew of any one having to thin a crop of almonds although in 1908 we did have some limbs as large as my arm break with their load of fruit.

SPRAYING.

You will need to spray your almond trees sooner or later. You may have to fight the fungus growths. If so, then you will find a friend in some form of lime, sulphur, or bluestone. You may have to fight red spider; then sulphur is a good remedy. It may be you will have to fight the peach moth larvæ; then some form of the arsenicals. In the writer's judgment you can just as well use your materials dry as wet. I have used the dry or dust spray exclusively for three years and am quite well satisfied with results. The great difference is on the commercial side of the expense account. The method we use is as follows: In December we spray with lime, sulphur and powdered bluestone (sal Bordeaux). We use 40 pounds of lime (Vigorite brand), 5 pounds of sulphur (Anchor brand), and 2 pounds of sal Bordeaux. This makes a very good treatment for two acres. When the trees are in full bloom we spray again with the same mixture and add to it 2 pounds of Paris green or 2 pounds of arsenite of lime. If there is evidence of the peach moth larvæ at work in the buds later, we spray again the last of May so as to catch the second brood, using the same formula as in the previous spraying, though the sal Bordeaux may be cut down one half or omitted entirely if there is no evidence of fungus about the trees. If red spider makes its appearance, then a treatment of the sulphur alone will settle Mr. Spider and turn the foliage from yellow to green in three days' time if you do not wait too long before spraying. In applying this dust spray we use a power machine which is quite inexpensive, mounted on a wagon and driven by a two-horsepower engine, the whole outfit weighing only about 1,000 pounds, drawn by two horses and operated by two men, which readily treat forty acres per day. The amount of material seems small to be effective, but being applied as a mixture instead of a chemical solution, as in the wet spray, it is every bit active. The principal thing, however, is to spray if needed, and if you don't want to use your application dry, use it wet, but be sure and *use* it.

CULTIVATION.

None of our orchard trees yield quicker or more decisively to good cultivation than the almond and the principle involved seems to be to maintain a sufficient degree of moisture. We are trying an experiment on a block of fifty acres of old almond trees, having seeded it to alfalfa last April. We shall water this as often as necessary, but cut no hay, allowing it to grow and fall on the ground as a mulch. If the trees do not bear with this treatment I will have added to the soil any way. When our orchard trees get to be over fifteen years old they will require irrigation where they got along very well before with good cultivation. Of course, I am speaking of conditions in our locality where the soil is deep and retentive of moisture under good cultivation, but without any subirrigation or summer rains.

HARVESTING.

Presuming that we have secured a crop and that it is time to gather it, we now come to the matter of harvesting, which is no small item in a commercial proposition. I am told that about fifteen years ago a company in our neighborhood who had about one hundred tons of a crop to harvest and having no machinery, advertised in the San Francisco papers for five hundred hands to help harvest their crop. About three hundred came a week ahead of time, and then it became necessary to bring out a squad of policemen from the city. We would not think of requiring over fifty people to handle such a crop now.

When the hulls on the nuts are loose from the shell, as will be indicated by their bursting open, it is time to begin gathering if you wish to hull them. If they get too dry you will have to wet them before hulling or you will break the shells. If you wish to shell them, then the drier the better. It will not pay to begin until the nuts about the crotches of the trees are ready and they will be the last to ripen. Tha is, it will not pay to go over the ground twice. When they are al ready you can get all at one gathering. Have some sheets made o heavy unbleached sheeting or light duck or sail cloth. Mine for large trees are 15 by 30 feet. Two men to a sheet and two sheets to a tree. Spread the sheets under the tree one on each side, lapping the edge where they join. Then the men take willow or bamboo poles and by jarring the limbs cause the nuts to fall on the sheets. Always strike the limb sideways for if you strike a glancing blow down the limb you will bring your chances of next year's crop with you. The object is to get the nuts and disturb the foliage as little as possible. Of course, you will get some nuts and twigs with the leaves any way. When the nuts are all off the tree, the men toss their poles to the next tree and then gather up the sheets, one man at each end of each sheet, and lifting them, carry them to the next tree, where the process is repeated. That is what they should do, but if you are not watching they will drag the sheets. If the time saved is worth more than the extra wear and tear on the sheets, then by all means drag them. When enough nuts are in the sheets to fill several lug boxes, the boxes are placed on the ground side by side and the sheets are emptied of their burden. These boxes are then stacked up so as to be easily seen and the teamster gathers them up and hauls them in to the shed, where they are run through the huller and then placed in the hoppers ready for the hand sorting. After sorting they are placed on trays or board platforms in the dry-yard to cure. They should be cured until the kernel will break without bending. Then they are ready for bleaching; but be sure they are thoroughly cured before bleaching or the kernel will absorb the sulphur and be spoiled. When properly cured, any means may be employed which will thoroughly dampen the shell, but not penetrate to the kernel and then be subjected to the fumes of burning sulphur for a period of thirty minutes to one or two hours owing to the variety and condition of the nut. A yellowish white color of the shell is demanded by the trade. Do not over sulphur. When sufficiently bleached they are removed and placed in the sun for a few hours to dry and then sacked up ready for market. My present plan of bleaching is as follows: When cured we place them on fruit trays about one inch thick and run them into a bin of the sulphur house which has been connected with a steam boiler (5 horse power), and then low pressure steam (20 pounds) is turned into the house for a half or three quarters of an hour. Then they are removed and quickly run in another bin, which has a sulphur charge ready fired, and bleached from forty minutes to an hour, when they are removed and immediately sacked. The same help will bleach twice as many in a day with steam as without it. Be careful not to use high pressure steam or you will cook the nuts. For this valuable method I am indebted to Mr. Reed of Suisun. Only standard almond sacks should be used, and while they seem expensive, they are a commercial success because they weigh two and a half pounds and no tare is taken by the trade if you use these sacks.

The almonds may also be shelled instead of hulled, as there are machines for shelling which do very good work. The present year our crop was light and we shelled our entire crop of about twelve tons of clean kernels. We figured better prices this way. Nearly all the imported nuts are shelled before importing. If you shell they are not to be bleached, and you have all of the shells to work back into the soil as material for humus, which is no small item. For a commercial proposition if you can get the same money for your product shelled, saving thereby half the hauling and return half the tonnage to your soil which you would ship off if the product were hulled, better do it.

MARKETING.

And now we come to the keystone of the whole matter. We may get lots of pleasure and satisfaction out of our orchards in producing a beautiful bloom and a splendid crop, but unless we can turn this into cold hard cash it will never be considered as a commercial proposition. It must pay! We must be able to make a net profit over and above the cost of production, or there will be no inducement to become or continue to be a producer. The last few cents per pound that the market warrants will be that net profit, and you should have it. Don't forget this. There are various efforts at coöperation among growers which are more or less successful, but there is no other line in which all might be enlisted as easily as the almond growers. The reason for this is the ease with which values may be determined. Just as long as the larger part of the almonds consumed are imported it is is plain that the price of the foreign product must fix the price of the home product. When we have a plentiful crop on this coast we have to ship some to the East. Therefore, the price of foreign almonds laid down at New York, duty paid, less the freight from here to New York will determine the price on this coast. When crops are light here we consume all our product on the coast, and then the price of foreign almonds landed at New York, plus duty and freight out here, will determine the price here. This is so fixed and definite that it should be easy to determine the market price, yet very few seem to know about it.

The present method of marketing in a haphazard way works a hardship on the grower because he does not always get a fair price for his product, the price the market warrants. As at present operated, the speculators learn about the foreign crop late in June or early in July, determine what the maximum price on this coast will be and then endeavor to purchase from the grower just as much below that price as possible. The object is not to buy low and sell high, for they usually sell on a fixed margin above cost, but the aim is to undersell their competitors when they go to the jobbing trade, as this is the one method above all others which will bring them business. The system is not to their real advantage, however, because they never know when a competitor may be able to buy still cheaper from some other grower and so undersell them or cause them a loss. The party who bought our almonds this year said he would just as soon pay 30 cents as 20 cents if the market was steadied so he knew just what he was doing. But when he buys on a two-cent margin, and some other buyer succeeds in buying from some other grower for two cents less, then the other buyer is able to depress the market to that extent in his quotations to the trade, and my buyer, as well as others who were inclined to deal fairly by the growers, suffer a loss which untimately falls on the growers themselves. Understand that if you sell below the market price, you not only lose the net profit that should be yours, but you cause a loss to all other growers and fair dealers. It is absolutely a case where no grower stands or falls alone, but he necessarily carries his fellow men with him. What we want is some method of marketing that will make the market for almonds as steady and stable as the market for flour or sugar. This will work no hardship to any one, but will be universally beneficial. It is a plan that ought to meet the approval of every buyer and seller alike. Then why not?

Local associations, able to render much valuable assistance to each other in the way of providing spraying, hulling and shelling machinery, of promulgating advanced ideas as to varieties, production, detecting and fighting pests, proper curing and preparing for market, marketing, etc., is the first step. It should not be forgotten that uniform handling and standard grading will be necessary and of untold advantage to the grower. Nothing like it could be done which would so speedily put the almond production on a solid footing and relieve some of the other lines of orchard and vineyard production. It would bring multiplied wealth to our State, employment to our citizens by increasing production, and help to settle the food problem of the race, because it is one of the most valuable and condensed forms of food production.

At present there are organized associations of almond growers in Sutter, Yolo, and Contra Costa counties, and in our own neighborhood we have a quasi association which handles 80 per cent of our output. Every one of these associations has wrought good results for its members and the trade. Then why not extend the work of organization? Let the growers in every section or community organize an association, and then all the associations select or form some central marketing exchange which shall do the marketing of the crop. This central exchange, with the foreign and home crop statistics before it, could determine what would be a fair price and should be given power to maintain said price. My word for it, the buyers would be just as glad as the growers to have this done if they understood it, and they might be given a hearing in fixing the price, but always the growers' organizations should hold the deciding vote. This is a point which can not be too strongly emphasized, because it touches on the weakest point in our body politic to-day. The farmer and the fruit grower constitute the only class of people in the world wherein the producer does not fix the selling price on his own products. The manufacturer, the merchant, the professions, labor organizations, all say what their services and products are worth. Is it not high time for the farmer and fruit grower to wake up and take his stand alongside of his fellow man? But it requires a Moses or a Joshua to mean success! Yes, to be sure; and also be sure that whenever anything is right and needs a Moses or a Joshua, the Power that shapes the destinies of men and nations will not be found wanting with the man or leaders. It all means dollars for every one engaged in the business and that spells *commercial success.* (Applause.)

PRESIDENT JEFFREY. The convention has heard this very able article and a great deal of good advice regarding the cultivation of this crop and the varieties to plant. We will not have time to discuss any of these papers this morning, as we want to give the other numbers full time. You will please note down any points you want to discuss. The second part of the program to-day is "Citrus Culture in the North," by Professor Elmore Chase of Fair Oaks. (Applause.)

MR. CHASE. *Mr. President, Ladies and Gentlemen:* When, a few weeks ago, our honorable Commissioner asked me to prepare a paper on citrus culture in the north, I protested that a man who had had only ten years' experience in this work was not qualified to do it. He said, "You can do it." I will try because he said so. I suspect, from that instance, that when our Commissioner has all the counties organized he will ask you to do something and you will be sure to go and do it. Things seem to be coming and have to come now. When I went to investigate some of the orchards in the northern part of the State I called upon a gentleman who was very successful in growing oranges, and I said to him, "We have come here to find out how you raise such a large crop of fine oranges in Oroville, larger than we raise in Fair Oaks." He said, "I can't tell you." The editors of horticultural papers put more into their papers than they can put in the ground, but I can assure you I can not put on paper what the orange grower puts into the ground, and so my paper is disappointing to me and I am afraid it will be to you, but the thing is in the ground if we can get it out.

CITRUS CULTURE IN THE NORTH.

By Prof. Elmore Chase, of Fair Oaks.

This paper will treat in a general way of the orange, not referring to grape fruit and the lemon, though both of the fruits flourish equally well with that of the orange. If any difference exists, it is in favor of the grape fruit. The methods of culture which apply to the orange will apply to the growing of other citrus fruits.

The citrus region of northern California has very indefinite boundaries; but it has been demonstrated by a few years of experience in growing this fruit, that it can be grown successfully over a great portion of the State, except in the extreme northern counties and in the higher altitudes of the Sierra and Coast ranges and in the lower interior valleys. The fact that the extreme southern counties have made this their chief horticultural industry, has given the impression abroad that this industry will not flourish elsewhere. Outside of these counties there are large areas extending the entire length of the San Joaquin and Sacramento valleys and as far north as Shasta in which very fine citrus fruits are grown. Not all of this area is suited to this industry, but the places which are suited to it are very numerous, and the acreage is rapidly increasing. Kern County produces a fruit of exceedingly good quality. Porterville and Lindsay in Tulare, and other places along the foothill lands are sharing the honors of this industry with similarly favored sections of the south. Placer has become well known by the orange groves of Loomis, Newcastle, and Penryn, and Sacramento by those of Fair Oaks and Orangevale. Butte County is made famous by the Oroville district and the adjacent colonies of Palermo and Thermalito. In fact, this county may be said to stand at the head of this industry in the farther north. It has an orange tree transplanted from Sacramento to Bidwell's Bar in 1859. Yuba and Stanislaus are pursuing this industry on quite a large scale, while Sonoma has been holding citrus fairs for the past ten years. Amador and Calaveras are not behind other places in growing a very excellent quality of fruit. Fresno also comes in for her share. Thus it will be seen that citrus culture in the North is boundless.

Let it be noted, too, that while orange trees from twenty to fifty years of age are growing all over this section of the State, the commercial industry dates back less than a score of years. This industry, while it has passed the experimental stage, is as yet in its infancy, and is now pushing to the front and contributing its share to the wealth and culture of our great commonwealth. No other class of producers is so active in seeking a better knowledge of horticulture than are the citrus growers of northern California. The appropriation of $16,000 for the purpose of investigating plant diseases in northern California, is equivalent to establishing in this section of the State an experiment station. The benefit of this appropriation is beginning to be felt in the citrus growing interests.

The burden of this paper is to try to answer the question, why a larger yield to the acre is not produced. While in quantity our products do not equal those of the southland, there is nothing to discourage any earnest grower. In quality, both of flavor and sugar content, there is nothing more to be desired. Northern California oranges suit the palate of the most fastidious orange consumer in the East, and that, too, many weeks before our fellow growers in the south can offer their products.

In the first place we have the earliest product in the State. Then next, in the absence of frosts and high winds, we have much to be thankful for. The absence of fogs saves us from many insect pests. The foliage of our groves always presents a brighter green and a cleaner face than is found even in the more southern belt of our section, an indication of health and vigor. The abundance of water and the system of irrigation contribute largely to the natural advantages of fruit growing, especially the citrus. These are some of the advantages the north enjoys over the south.

The one thing now is how to increase the quantity of the product per acre. It must be remembered that our trees are yet young. With few exceptions ten or fifteen years is the age of the productive orchard.

The following statement may be taken as a reasonable estimate of the returns from a well cultivated tract in the citrus belt of the north: The third year, per acre, 10 boxes; the fourth, 50; the fifth, 100; the sixth, 175; the seventh, 225; the eighth, 275; the ninth, 300; and the tenth, 325. This, though not so large as is often reported in the south, is a good showing and is realized in Tulare and in Butte counties as well as in some groves between these two places. Not many orchards during the first ten years produce this amount per acre; but it is possible to do this, and after this period of growing with the application of the best methods known, these trees may be made to increase this yield almost indefinitely, and in proportion as this culture is wise, the quality may reach as high as 90 per cent of fancy.

How can this be accomplished? First, before planting, the character of the soil should be examined. If an impervious soil is found at the depth of two feet and it is so thick that dynamite will not break through it, the orange tree will be able to do work not more than ten years. If the soil is deep and the drainage is good, it is safe to plant the trees. But this planting must be well and wisely done. The Whitney ranches of Placer County have made their owner prosperous mainly on the method of planting. The soil is of a reddish gravel and looks not very inviting, but the orange tree seems to take to it. The hole is dug some six feet in diameter, and as many feet deep. Then it is widened by filling into the bottom the surface soils about the hole. The tree is planted and then a scraper is used to bring about the trees the surface soil near at hand.

Much of the land is hilly and ravines and "draws" are formed between the hills. These ravines and "draws" have been made by erosion. In most cases the land is composed of strata of different degrees of hardness. The deep soil is generally on the higher places. In cutting out the ravines or "draws" by erosion, several of these strata are cut through and on the sides of these slopes one or more of the ends of a hard stratum is very near the surface, so the trees planted on the brow of the hills sometimes do not thrive as do those lower down or on the top. The result is, if no heed is paid to these conditions, many trees will not reach the productive age except in a feeble and sickly condition. By blasting and excavating, and giving good drainage, such places will give good results. Successful growers after preparing such places, fill the hole with water, and if it drains readily plant the tree. If not, then another trial is made. The saying that "an orange tree must not have wet feet," is a maxim in citrus growing and must be heeded, always. It may be said that every step taken in planting, budding, and caring for an orchard of citrus fruit must be performed by labor skilled in this line of work, and nowhere is it of greater importance than in preparing and planting an orchard. The most important thing after planting is the caring for the tree. Nature has been generous in this particular in this State. She has put into the ground a sufficient capital for a good working basis; but this capital must not be all withdrawn before deposits are made. As the tree draws on this capital, the soil must be supplied with new deposits. Here it requires the greatest knowledge to do this and keep the trees working at their best. Many an orchard of fine promise has been ruined by irregular cultivation or "hit or miss" fertilization.

Irrigation is a matter of supreme importance. It must be governed largely by the character of the soil and the mode of application. The main idea is to give the soil a sufficient amount of moisture to supply the root system with all its needs before the next irrigation. This implies that the irrigation must be abundant, but not too frequent, and the water must reach to the depth of the lowest roots while the surface soil must be kept dry and sufficiently stirred.

Another matter which has much to do in reducing the yield in many orchards is the fact that so many trees are not the type of the true navel. It will be difficult to find an orange grove in the whole orange belt of the north which has not suffered to a greater or less degree because of the presence of such trees as the Australian navel and similar types. These in our most productive orchards are all budded over as soon as discovered. In three years from budding these trees will begin to produce fruit, and in five years the fruit will not only have paid for all cost, but will begin to bring in an income. In ten years such an orchard becomes the type of those which bring in the large incomes of which we read.

When our orchards shall have reached the age of ten years under the conditions which have been hinted at above, then the grower may exploit his trees according to his pleasure. If he wishes fabulous returns, he may spend a hundred dollars an acre for fertilizer, and he will not be disappointed. If he desires a more moderate and perpetual income, he may spend ten dollars an acre and receive from his grove a very satisfactory return. Mr. Mills of Riverside calls an orange tree a machine. Supply it with material and run it at high speed and it will turn out a large product. Mr. Boalt of Palermo calls an orange tree a cow. Feed her high and she will yield the butter fat, but she will not last long. So, also, does high pressure speed wear out a machine. When $3,000 an acre can be made by this high pressure principle, the temptation is so great that it will be done if it kills the cow or bursts the boiler. An orange tree, however, is not a cow or a machine. It is a self-perpetuating, ever growing plant with self-regulation forces of plant organisms. It renews its fruit bearing organs every season and regulates its root system to meet all demands of fruit and foliage, provided it has the materials which it needs and its root system has the fullest freedom to do its work.

But the wiser method adopted by the majority of growers is to supply the fertilizing materials according to the normal demands of the tree. Stable manures and cover crops furnish the humus that every orange grove must always have, if satisfactory returns are expected. Added to these a liberal use of commercial fertilizer of any well known brand, the orange grove will keep in a good thriving condition for a whole generation.

Another important thing which must never be overlooked is the matter of pruning. The orange tree is so self-regulating that it requires little pruning. The most successful growers advise keeping the deadwood cut out, removing the suckers and pruning back excessive growth which may to some extent destroy the symmetry of the tree and allowing the branches to grow low. More fruit is gathered from the lower third of the tree than from the upper two thirds, and is less subject to injury by the moving branches. The cutting out of dead twigs gives opportunity for more fruit to grow inside the tree, and this fruit is the finest of all.

During the whole life of an orange tree, deep and thorough cultivation is the command of every successful grower. This must be done to keep the lower soil loose and free from the so-called "hard pan," which always prevents the root system from performing its functions unhindered. Nearly every so-called disease of the orange tree can be traced to some soil condition which destroys the action of some portion of the root system.

The limits of this paper do not permit references to the methods of successful growers which would give more force to general statements. Each statement properly treated would be a topic for a separate paper, but it can be confidently affirmed that citrus growing in the north is destined to become a much more important branch of industry than it is at present. Indeed, with all other branches of fruit growing which have reached such a high degree of excellence, citrus culture of the north must become the overshadowing industry of our great commonwealth. A no more inviting field of usefulness can be offered to any one who loves his own State than that of establishing a citrus nursery in the north which shall have for its prime object to produce the typical navel orange tree; for this fruit can not be modified by changes of the embryo, but by adaptation of the bud development only.

The late lamented Lelong has said, "There is a subtle and delicate citrus quality that must be associated in all the qualities of an orange. It can only be described by saying that it appeals to the intellectual perceptions as that natural goodness and excellence inherent in the choice products of nature. This can be eliminated from the orange and render the fruit insipid and valueless. We must be careful in the selection of stock and bud so that we shall draw toward this noble fruit and gift of nature the happy union of staminate and blended qualities that award the halo of ambrosial excellence." This is especially true of the navel orange.

The case is a clear one that northern California offers a very large field for the growth of the orange, lemon, and pomelo, if the knowledge of this industry now within the reach of all is intelligently applied at the beginning and continued during the life of the orchard. The main points to be followed are, plant only typical navels, in any soil that will give room for the growth and increase of the root system; begin to add fertilizing material early, cultivate constantly and deep, and irrigate deep enough to supply the whole root system with moisture, adding yearly humus-producing materials, either in the form of stable manure or green cover crops, or both, using liberally commercial fertilizers, and doing all these things so faithfully that the tree never for an hour suffers for the lack of this food. These things faithfully performed and a citrus grove will never fail to pay large returns on the investment in northern California. This is now being done in Porterville, Lindsay, Fair Oaks, Oroville and its colonies.

Colonel Weinstock once said, in speaking of the influence of horticulture in this State, that the people who produce the luxuries of life have a higher degree of civilization and live on a higher plane of enjoyment than those who produce the necessities of life. They love the good and the beautiful. Art, science, and literature flourish among such a people, and they become, if not always the originators of all the forces which improve the condition of the human race, the disseminators of all these forces. He referred to the French nation, which has been eminently the producer of the luxuries of life. "Her literature has been to the English what Aaron was to Moses," says Macaulay. Her university was the first great intellectual center of Europe. Scholars by the thousand have flocked to it from all over the world, so that through its influence, knowledge was kept alive and disseminated, so that, in one sense, the French university was the mother of all that were subsequently founded throughout the world. The foremost historian of the nineteenth century has said, "There is hardly any great idea, hardly any great principle of civilization which has not had to go through France to be disseminated." California, so similar to France in so many of its natural aspects of climate, soil, and nature of its productions, is already rising to that higher plane of civilization which may become to the other people of this continent, if not to the whole world, what France has been to Europe. Shall we claim too much for the influence of the orange that it has done and is still doing this work of a higher civilization? Recently some writer in Oregon entered into a very learned dissertation on the relative values of the apple and the orange. The former he placed among the necessities of life, the latter only a luxury. Some California journalist in a broad and generous spirit, such as must prevail where the orange grows, has rescued the apple from that low place and elevated it to a position where it belongs among the luxuries, and luxuries are necessities when man reaches the higher plane of noble living.

Surely the whole State of California appeals to man's better impulses, and invites him to come and make his home among her apple orchards and citrus groves, where are ever found those influences which lead to the best in human life. (Applause.)

PRESIDENT JEFFREY. The next paper is entitled "The Berry Industry," by Mr. W. I. Newcomb of Sebastopol. (Applause.)

THE BERRY INDUSTRY.

By W. I. NEWCOMB of Sebastopol.

In taking up the question of the berry industry this paper will be confined to Lawton blackberries, Antwerp and Cuthbert raspberries, loganberries, and Mammoth blackberries, with incidental mention of a few other varieties that are grown in the foothill region of western Sonoma, adjacent to Sebastopol, and locally known as the Gold Ridge country.

While the growing of stawberries is carried on to some extent, one of your large "patches" in the Pajaro Valley contains more than our entire acreage. We leave this variety to the Watsonville district, whose reputation for growing this berry is world-wide.

Berries have been grown in the Sebastopol district since 1872. At that time the late W. J. Hunt planted the first blackberries. It was soon proven that the sandy loam soil, together with the moist cool summers, tempered by the coast breeze, and an abundance of winter rains, made it a favorable place for berry raising. The first planting was of the Lawton Black variety, and its adaptibility has been proven by the test of time, for to-day it leads in production by double all other varieties combined.

The planting of Lawtons was soon followed by the Antwerp raspberry, which was usually called the Cuthbert, but differs considerably, both in fruit and growth, not being so rank a grower and fruiting in a shorter period, making it better suited for canning purposes, to which the berry business developed into, as San Francisco was the only fresh market available, and the profits from planting these two varieties stimulated planting to such an extent that in a few years there was such an overproduction that if the canneries had not taken hold of them the berries would not have been worth raising.

During these years of development berries showed the same fault that all other California fruits have shown, viz., production taking place faster than consumption, the finding of new markets for this class of fruit at a distance being considered impracticable on account of its perishable nature. The first attempt, when the production became too large for the San Francisco market, was in evaporation. Good success resulted in this effort and a good trade was built up. Then the cannery came into the field and the tide ran the other way. No berries were dried, consequently that trade was lost.

The cannery requirements for berries were easily met. Fruit too ripe for shipment was in just the condition for them. This led to loose methods of picking and handling and quantity only was considered, until the grower was handling his berries about the same as he would a hay crop, and was only sorry he could not use a derrick fork. All this led to one result, the canneries saying they had more berries than they could handle at the price; consequently a gradual lowering of prices until during the past two years the returns, based on the valuation of the land and labor, would not pay the cost of production. This may look like a dark situation for the berry growers, but fortunately our eggs are not all in one basket.

CULTIVATION.

Cultivation of our berries consists of thorough plowing, hoeing and cultivating, no irrigation being done. Different habits and growth of the varieties, however, require different training. The Lawtons are upright growers, and are usually planted eight feet apart each way. The plants are obtained by digging the shoots that are thrown out late in the season near the "hill." The second season of growth the vines are staked with two redwood stakes, 2 by 2 and 6 feet in length. They are driven one on each side of the vine close in, but spreading at the top to allow for lateral growth and ease in picking.

The raspberries are grown without stakes, and are planted more closely. A good way to plant is, 3 by 8 and allow to make a solid row one way.

The Antwerp raspberry is a heavier bearer than the Cuthbert and slightly more acid. The light, drier and more sweet Cuthbert has better carrying qualities for shipping fresh, but has not proven entirely successful in our locality, from bearing too much second crop in the fall, especially when we have early rains. Evidently the season is too long. At Puyallup, Washington, 750 tons of this variety are raised annually, but their spring is a month later than here in California and the fall a month earlier, and they are not troubled in this way.

The Lawton blackberry and the raspberry were the only bush berries grown until the advent of the loganberry, originated in your neighboring Santa Cruz. This berry met with favor from many, its term of fruiting filling in a gap before the later Lawtons. Its adaptibility to a great variety of soils and climate has given it a wide planting, and its vigorous growth and prolific bearing has made it a favorite garden berry.

The success met in crossing the California dewberry with the red raspberry, the Logan, led to much experimenting, with the result in the past few years of several new varieties. The value of some of these remains to be seen. Probably the next best of these crosses is the Mammoth blackberry, which is in full fruiting at the time the Logans are on the wane and the Lawtons are beginning to ripen. Thus, in our section we have succession of Logan, Mammoth, and Late Black, as we are beginning to call the Lawton since the Mammoth has come into the market.

Another new variety is the Himalya, a strong grower and good fruit, and may prove a good berry in some less favored climate and soil, but so far does not seem to supplant any of the older varieties. I suspect that one reason for this is the quite thorny nature of the vine, but it certainly is a hardy grower and will eventually find its place.

The Logan, Mammoth, and Himalya are running vines, and have to be trellised. This is done in the winter, two wires being used, one above the other, at two and three feet from the ground. The plants from these varieties are got from "tippings," which means putting a shovelful of soil on the tip of the new growth in the winter, causing it to take root. By spring they are ready to plant. Thorough preparation of the ground and good care afterwards will give the results obtained in all other fruit planting.

HARVESTING AND MARKETING.

The first fruit growers' convention which I had the privilege of attending was in San Francisco seven years ago. In one of the discussions there the Hon. John Markley made this remark, "We have been telling the people in these conventions for the past twenty years how to grow fruit, but from now on we must show them how to harvest and market it."

And these, friends, are the two most important factors in any kind of fruit growing—proper harvesting and then getting the price that will justify the cost and labor of production.

Fruit raising of all kinds has had its ups and downs here in California, where production has been easy, compared to reaching our distant markets, and our berries have been no exception to the rule. In these years of development, or underproduction, overproduction, overconsumption, and underconsumption, the berry business has had as many stages of prosperity as the much-quoted prune.

We have heard, in our district over by the coast, a great deal these past few years of raisin growers' associations, fruit unions, farmers' unions, fruit exchanges, and so forth. This, together with the canneries continually telling us that we were producing more than they could sell only at a low price, until we became infected with the microbe, or perhaps "parasite" of coöperation. Or at least a part of us, for I believe there has never been any community yet where the disease has reached, but what a part of the inhabitants were immune from all forms of contagion.

Those of us who took "it" in the worst form talked coöperation in season and out. This finally resulted last February in the formation of the Sebastopol Berry Growers, Incorporated, under the laws of the State, with a charter which allows us to do anything we might care to do in the fruit and farm-supply line. This happily took place just in time to prevent half of us having our wives leave us in disgust. I wish to say that it is actually appalling, the amount of time and talk it takes to get this virus to work.

We incorporated with thirty out of one hundred and twenty-five growers, secured a manager in the person of a party who had done considerable berry-shipping business, thus securing all the available experience in this line. Our main effort the past season was to get as many of our berries into fresh consumption as possible and thus relieve the canneries. By the time the crop was ready we had increased our membership to eighty. We took up the matter of car-load shipments with Wells-Fargo & Co., who gave us all the assistance in their power, with the result of our sending a representative to the large Rocky Mountain and northern cities, including Odgen, Salt Lake City, Denver, Butte, Montana, Spokane, Seattle, and Portland, and of our dispatching one or more cars to each of these cities. In some of them we did well, and in some we did not, but all the time we were learning, and after the season was over and the smoke of battle cleared away we found that Wells-Fargo had gotten about $8,000 for transporting our berries, and after all our expenses were paid we had as much or a little more than the man on the outside and our experience as an asset for future business.

Some of the things we found we needed, and succeeded in getting; part this year, and a promise of next were: lower rates, smaller minimum loads, and a better railroad time and connections.

While we are in the habit as fruit growers of laying most of our troubles to the railroad and express companies, there is one thing we must not lose sight of, and it is this, unless our fruit is properly picked, packed and loaded, all the railroad rates and service in the world can not make it arrive in good condition at the other end. This rests with your individual growers and corporation inspection. While some growers think they will lose their individuality by joining an association, they really have a wonderful opportunity to preserve it in this way.

There is no doubt but that coöperation is a remedy for many of our ills. This is an age of combination. But they must be carried on strict business principles, and we have much to learn. We may, perhaps, have to wander in the wilderness until we grow a new lot of men that are willing to give and take and pull together for their own sakes as well as the community, for the prosperity of the community is in a direct ratio to the prosperity of the individual. In the mean time we will have to depend largely on a Moses for leadership. But it does look as though the children of Israel had a pretty good time, even in the wilderness. They certainly did not have to make any bricks for the Egyptians. (Applause.)

PRESIDENT JEFFREY. We will now have the pleasure of listening to a paper by Mr. G. P. Rixford of San Francisco. The title is "The Latest Development in Fig Culture." (Applause.)

MR. RIXFORD. I would like to have it understood, Mr. President and ladies and gentlemen, that the subject of my paper, the fig, is as old as Mr. Dargitz' almond. It figures in the Bible as well as the almond. We don't want to play second fiddle to the almond. Perhaps he is more familiar with the Bible than I am.

THE LATEST DEVELOPMENTS IN FIG CULTURE.

By WALTER T. SWINGLE and G. P. RIXFORD of the U. S. Department of Agriculture.

For the first time in the history of Smyrna fig culture in California, the markets have this fall been partially supplied with home grown Smyrna figs that many experts pronounce equal to the product of the famous fig district of Asia Minor. We say partially, because the quantity offered is not one quarter part of the requirements of even the local markets. The writers know one buyer who never handles any but the best of everything, who wants ten tons of a certain pack put up at Reedley, Fresno County. This particular producer could furnish only about four tons from his young ten-acre orchard. This is certainly an encouraging outlook for the industry, and holds out the promise that when enough such figs are packed to supply the American market, the million dollars annually paid to the Turks will be paid to the California fruit grower.

The Smyrna is the best of all figs grown in the world and nowhere equaled in the eastern hemisphere outside the limited area of the Meander Valley, a district about 75 miles in length and 10 to 12 miles wide, and situated about 50 miles southeast from the city of Smyrna. The figs of southern Europe, including Spain, Portugal, the south of France, Italy and Greece, as well as the north of Africa, all fig growing countries, have failed to yield a product which for tenderness of skin and delicacy of flavor compares with that of the Adin district mentioned above. It is, therefore, a matter for congratulation, that only in the sunny valleys of California, of all the world, can this delicious product be equaled.

One of the writers recently sent samples of the product of two growers at Reedley and one at Selma to the United States Department of Agriculture at Washington that must have produced a sensation, as a telegram was immediately received to send ten or twelve pounds more for exhibition purposes. The department has taken a deep interest in the establishment of the industry on the Pacific coast, and is evidently impressed with the progress that has been made. In fact, the industry has to a great extent passed the experimental stage.

A VISIT TO THE PRINCIPAL FIG DISTRICT.

At the instance of the department, it was the pleasure of one of the writers two weeks ago to make on extended visit to the fig growers of the central part of the San Joaquin Valley, in the counties of Stanislaus, Merced, Madera, Fresno, and Tulare, where the industry has its greatest development; largely due to the efforts of Mr. Geo. C. Roeding of Fresno. More than a thousand acres have been planted in these counties, more than half in Fresno, most of which have reached the bearing age. There was a twofold purpose in this visit. One was to see the men who are putting up the splendid product, samples of which are here presented for your inspection, and the other was to ascertain the cause, and, if possible, suggest a remedy for the discouragement known to exist among a portion of the growers. It can not be denied that failures have been made and in a few instances bearing trees have been dug up. But it is a satisfaction to be able to say, that with a little time and attention to details, the cause of the failures can be removed.

CAUSE OF THE FAILURES.

With soil and climate well adapted to the industry, it is regrettable that any failures should have occurred. Intimate contact with a large number of growers has impressed the fact upon the writers that the great and paramount cause of failure is an inadequate supply of the fig wasp, *Blastophaga grossorum*. The crop depends absolutely upon the number of this minute, but beneficent insect, that is supplied to the Smyrna trees and upon a sufficient number of good capri trees to support them. Here, then, is the condition of affairs with which we are confronted. Some growers have no capri trees at all, having neglected to plant them when putting out their Smyrna orchards; many more have too small a number and not of the best kinds, while in some instances the trees are scattered about in the Smyrna orchards at considerable distances apart—too far for the trees to properly assist each other in sustaining the insect through the year. Occasionally, a grower is met with, and fortunately the number is very small, who has, perhaps, mistaken his calling in becoming a fruit grower. One such, in speaking of his small Smyrna crop, was asked if he had a good supply of capri figs and the fig wasp. Replying, he said, "there was a good many bugs flying about his place and he thought he was getting his share." It is not surprising that his crops are small.

In that portion of the San Joaquin Valley mentioned, the principal capri varieties are Roedings Nos. 1, 2, and 3. While these varieties are excellent in some respects, others can be added to the list that will give much value to the whole. Some think that No. 1 is the best of the three, and it is valuable in producing an early profichi or spring crop. No. 2 seldom bears a mamme or overwintering crop, though an abundant profichi crop, and must therefore be planted where it can be fertilized by other capri trees. No. 3 generally carries a fair mamme and a good profichi crop. As some capri trees fail to produce all the crops required for the support of the blastophaga through the year, it is recommended that several varieties be planted, that they may fertilize each other and thus with more certainty furnish an abundant supply of profichi wasps in early summer when required by the Smyrna trees.

THE MILCO CAPRI.

Among the most valuable capri trees is the Milco, named after the late G. N. Milco of Buhach fame. This tree has been under observation by one of the writers for some years in widely separated localities and under varying conditions of soil and climate, and he has never found it to fail to carry an abundant mamme, a fair mammoni and a large profichi crop. As a striking evidence of the value of this variety it may be mentioned that a number of old trees, giants among their fellows, have been found that have carried the insect unaided by the proximity of other trees, for forty years. Some growers rely on this variety alone and never fail to have an abundance of fertilizing material. While being one of the earliest producers of profichi figs, it is also one of the latest, and possesses the virtue of giving a steady succession of profichi from the beginning to the end of its season. Most capri trees when under five years of age fail to carry an overwintering crop, but the Milco is one of the most precocious in this respect of the whole list under observation. This tree, then, with our present knowledge of the hundred or more varieties now in cultivation in this State, is confidently recommended as one of the most desirable to plant.

HISTORY OF THE MILCO CAPRIFIG TREE.

In this connection it may be of interest to give a brief history of the first introduction into this country of the caprifig tree and the blastophaga. On the ranch of Samuel Gates, 10 miles west from Modesto, stands an ancient capri tree about 45 feet high with a spread of branches of 40 feet and a trunk 8 feet in circumference just below the branches. The tree was planted in 1867 by Lewis Adams of Stockton, who purchased it with other trees from the late W. B. West, an enterprising and intelligent nurseryman of the same place, well known to many of the older fruit growers of the State. Of these old capri trees, of which the Gates is one of the oldest, more than fifty have been located by one of the writers. About thirty are growing in the vicinity of Ripon, two near Lathrop, seven at Stockton, and about a dozen near Milton. Some of these trees are about as old and about as large as the Gates tree, and we have positive proof have carried the blastophaga for about forty years. A number of them have been traced directly to the West nursery and as they are all of the same variety, there is little doubt that they all came from the same source.

It was supposed that the fig wasp was first sent to the new world from Algiers by one of the writers in 1899, but the discovery of the insect on the Gates and the Lathrop trees, proves that the first introduction antedates that of 1899 by more than thirty years. A question of much interest in connection with the Gates and Lathrop trees is, how did they become infested with the blastophaga. W. B. West probably imported more fig trees than any other man in the State. In 1865, two years before the Gates tree was planted, he imported twenty-two varieties from the south of Europe by way of Panama, the first overland railroad not then having been completed. As it was possible only for the insect to be brought over in the caprifig itself, it is reasonable to suppose that the trees imported by Mr. West carried mamme figs containing the insect and that it was established in the Stockton nursery before the trees were distributed. As all these old trees are of the same variety and most of them are known to have come from that nursery, it is a reasonable conclusion that to W. B. West belongs the credit, though probably unknown to him, of having first introduced the blastophaga into America. That caprifigs on trees or cuttings could retain their vitality long enough to make this possible has been proven by one of the writers who took cuttings with mamme caprifigs attached from trees in the Maslin orchard last December and planted them in his yard in San Francisco. In May following the wasps were alive and about ready to issue, but a spell of warm weather in June dried up the figs and killed the insects. This shows that even on unrooted cuttings it is possible to keep the insect alive for six months. This introduction by Mr. West was undoubtedly accidental. The late Mr. Fred West, cashier of the Stockton Savings Bank, was at the time of this importation a partner of his brother in the nursery business. He said to one of the writers, just before his death, less than three months ago: "If we imported the capri tree and the blastophaga, it was purely accidental, as we knew nothing about either the capri tree or the insect, but thought we were sending out a choice variety of the Smyrna fig.

CUTTINGS AND CAPRIFIGS AVAILABLE FROM THE LOOMIS ORCHARD.

At the Maslin seedling fig orchard at Loomis, Placer County, which is under lease to the United States Department of Agriculture, are several very desirable capri, as well as a number of choice trees of the Smyrna type. These capri trees have now been sufficiently studied to enable us to select a half dozen or more of the very best. They are vigorous trees, producing mamme and mammoni crops in sufficient abundance, and above all enormous profichi crops of large figs, abundantly infested with blastophaga and having plenty of pollen. The resources of this orchard, both in caprifigs and cuttings, are placed at the disposal of all who are interested in fig culture. Cuttings from the best trees without cost and caprifigs at the bare cost of gathering and shipping will be supplied when requested. Any one desiring either the fruit or the cuttings has only to send his name to the writers at 1813 Pierce street, San Francisco, and he will receive blank applications and circulars giving the conditions of the distribution. Last winter nearly ten thousand cuttings and seedling trees and last spring several hundred boxes of mamme and profichi caprifigs were distributed. This winter and next spring further distributions of the most desirable kinds will be made.

PLANTING CAPRI TREES.

Every grower should aim to have an independent supply of fertilizing material of his own. This can be done only by planting a number of varieties of the best capri trees proportionate to the number of Smyrna trees in his orchard. If he has old trees of any variety he deems undesirable for any cause, let him insert capri grafts of the best kinds and by this means supply himself much sooner than by waiting for young trees to come into bearing. Smyrna trees will show some fruit as early as two and three years, and which, if caprified, will come to perfection. It is recommended that capri trees at the rate of two to each acre of Smyrna trees be planted by themselves in one corner of the orchard, or if there is a knoll or spot reasonably free from frost, put them there. They may be planted as near as 20 feet apart and if sheltered by a wind-break to keep off cold winter winds, all the better. A number of growers may combine and plant a tract to capri trees in a sheltered spot even at some distance from their orchards, if thereby they can secure protection from the hardest frosts and also obtain earlier profichi caprifigs in readiness for the first Smyrna figs that reach a receptive condition. There is no danger of an oversupply of caprifigs, for there will always be a demand for the surplus from growers who have from some cause an inadequate supply. In the fig districts of Asia Minor, where fig growing has been a great industry for thousands of years, caprifigs are a regular article of trade in the markets. The reason for planting capri trees apart from Smyrna trees is that they more effectually fertilize each other and that a more even distribution of the caprifigs may be made by hand among the Smyrna trees. The question is often asked: Why not plant the capris among the Smyrna trees and let nature take her course? In Asia Minor it is firmly believed that overpollination is the cause of the splitting of figs. The writers do not believe that this is the sole cause, if a cause at all of the trouble, for reasons that will be given further along. It is not desirable that more than one or two blastophagas should enter each Smyrna fig. At Loomis, where at times the insects are seen hovering over the trees like swarms of gnats, it is not unusual for a dozen to enter a single fig. One of the writers has counted as many as twenty-five wasps in one fig and another struggling mass of fifteen at the entrance trying to get in. Capri trees planted at considerable distances from each other in the orchard receive very little help from other capri trees in carrying the insect from crop to crop, and when the tree is of a variety that carries no mamme crop its profichi crop is likely to be a failure. It may be noted that the more accessible the figs to be caprified are to the blastophaga, the more of them will be entered. In some instances we know that the wasp has fertilized trees some miles away, perhaps carried by the wind, but not in sufficient numbers to produce a crop.

THE SPLITTING OF FIGS.

The past season is reported everywhere to have been an ideal one until the September rains came. These were followed by cool, damp weather, with considerable splitting and souring of figs. It is the sentiment of many growers that splitting is caused by cool, damp weather and not by overpollination, nor excessive irrigation. One of the writers has seen trees growing on the banks of an irrigating ditch, in which water was flowing a good part of the year, and the fruit on these trees split no more than on trees in other parts of the orchard which were irrigated only twice during the season. One grower, however, speaking of the large size of the figs on these trees said he would rather have some splits than small fruit. One large Smyrna fig orchard planted on ground so moist that a drainage canal is being constructed through it, showed very few split figs. Certain trees and some varieties, the White Adriatic for instance, split worse than others. In the Maslin orchard are trees with fruit that split more or less every year, while others, equally surrounded by capri trees and swarms of blastophaga, show no splitting at all. Location seems to have something to do with it, as in Fresno County in those orchards near the foothills the trouble seems to be less prevalent than out in the valley. The past season in most localities has been the worst in several years, still it is not a very serious matter. It is noticeable that of the Lob Ingir many split specimens close up in drying and still make good figs. This fig contains so much sugar that, unlike the White Adriatic, very few sour even when split. It is at present difficult to account for this trouble in many cases and the subject should have further study.

CURING FIGS.

It is well known that when the Smyrna fig is perfectly ripe and nearly dry it falls to the ground. It is likely that most growers will find it less troublesome and about equally profitable to sell the product to the packing houses as soon as sufficiently dried, rather than attempt to gather around him the necessary labor and appliances to put his fruit into elaborate packages in order to secure the highest price.

A few suggestions, some of which represent the experience of the growers who are putting up the best figs now on the market, may not be out of place at this time, and may be of service to the inexperienced. One of the most important details, though troublesome, is to gather the fruit from the ground very often, in fact as often as every other day. This will in a great measure prevent the entrance of beetles that lay their eggs and make wormy figs. Another important consideration is not to dry the figs too much. If too dry the seller not only suffers loss of weight, but also injures the quality, as overdried fruit must be processed before it can be packed. When the figs have become sufficiently cured they are still pliable, yielding to a slight pressure of the fingers. In very warm weather the smaller figs are sufficiently dried when they fall from the tree. The larger will require exposure to the sun on drying trays for two or three days. After the figs are sufficiently dried they are rinsed in clean water to remove any dust or dirt that may have adhered to them, and are then exposed to the sun long enough to remove the surplus moisture. After grading as to size they are put into sweat boxes and are pressed down into a solid mass, where they remain a week or ten days to undergo a sweat. This treatment is a very important part of the curing process. The overdried fruit absorbs moisture from the underdried, softens the skin and is a decided benefit to the whole. In this condition the figs go to the packer. In order to kill germs or the eggs of insects that may have been deposited in the figs while exposed under the trees or on the drying trays, some packers expose the fruit to hot steam for a few minutes, while others immerse it in boiling brine, made with three ounces of salt to a gallon of water, for two or three minutes. In curing the figs exhibited here no salt was used. After this heating process the figs are soft and pliable, and are then split open from stem to apex and spread out in layers and pressed into bricks of a pound or half pound in weight, and are then either wrapped in waxed paper, like those before you, and the bricks packed into 25-pound boxes, or are first put into fancy cartons and then packed into boxes of various sizes.

It may here be mentioned that certain varieties of trees produce figs that may be called self-sealed, the eye being stopped by a drop of hardened syrup or pellucid gum that effectually prevents the entrance of filth beetles and other vermin, and thus assures figs that will not get wormy without the scalding process. Cuttings of this variety will be available from the department distribution mentioned above.

CONCLUSION.

While the production of the finest figs requires some attention to details, such as the care of the capri trees and caprification, not necessary in growing other fruits, there is nothing in the work not easily mastered by laborers of average intelligence, while the fig tree possesses compensating advantages. The crop is never lost by late spring frosts, the tree requires little pruning, no spraying and no thinning of fruit, which means a saving of labor fully equal to that required in caprification. The prospective fig grower need not, therefore, be deterred from entering upon the industry for fear of troublesome details, while he can be assured that when his trees are five or six years old and in suitable soil and climate, they will bring him a gross income of about a hundred dollars per acre at present prices, with a steady increase for a generation to come. (Applause.)

MR. MARKLEY. I want to say, up in Sutter County the Calimyrna grows very well and sets heavy crops, but we have not been able to ripen many figs. We have Roeding Nos. 2 and 3. No. 1 never has anything on it to amount to anything. No. 3 has a very large profichi crop. What we want is a caprifig that ripens the crop ten days earlier than Roeding No. 3.

MR. RIXFORD. It is a question whether we have capri trees that fruit early enough for your purpose. The only way I have seen it done is to plant the capri trees in some very early locality.

MR. MARKLEY. I want them later. It ripens before the Calimyrna and drops off.

MR. RIXFORD. You can get caprifigs from the vicinity of Modesto and Turlock and Ripon where the insects do not issue nearly as early as they do at Fresno, and if you want them still later, those grown at Niles—this year they did not issue until the 25th of July.

MR. MARKLEY. The climate of Niles is so different.

MR. RIXFORD. Still, the insect flourishes there.

MR. MARKLEY. If I took a Niles tree to Sacramento Valley it would change its habits.

MR. RIXFORD. We are giving a good deal of attention to that matter of varieties and trying to select a list of caprifigs that will give a succession. We now have a list that will give a succession for three or four weeks. The Smyrna fig continues to push its crop for four to six weeks. Of course, the latest ones, if they are caprified, perhaps would be too late to escape the fall rains, but the crop can be very greatly increased by having the caprifigs at various times. The men best posted, in sending to me, say, send 50, four or five days apart. The reason is, to-day there may be a certain number of Smyrna figs in a receptive condition. A week later there will be another lot, but in the mean time the first caprifigs have dried up and the insects are dead, and that is the reason why a succession of the caprifigs is important.

PRESIDENT JEFFREY. I am going to take the liberty of calling on four old members of this convention before noon. I am going to ask Mr. E. W. Maslin to speak five minutes on seedling fig orchards.

MR. MASLIN. *Mr. President, and Ladies and Gentlemen:* I am suffering from a very severe cold. I have very little of importance to tell you or to add anything to the knowledge of how to grow a Smyrna fig. I suppose my worthy Commissioner simply wants me to tell you how I grew the Smyrna fig and what induced me to do so. I have about twenty or thirty varieties of figs in my orchard at Loomis, and conceiving the idea that I could grow a Smyrna fig, of which there were none at that time, I knew, in the State, I wrote to Mr. Thurber of New York and asked him to send me a box of Smyrna figs. He sent me the Imperial figs, which I put out in 1886. I formed a nursery and put out fifty-three trees in the vineyard orchard and about 15 acres in the flats. The flats were destroyed; I destroyed them myself. Every tree, nearly, had a different variety of fig and leaf. One year I raised one tree of a purple fig which ripened. My notes seem to state what was not true, that I planted the south part of it with figs from San Francisco. Those were planted with the best figs I could buy in New York, for which I paid 30 cents a pound. These figs were grown without irrigation; I had not the facilities for irrigation. Some time in 1900, I went out to Mr. Shaw's place. At that time I did not believe in caprification. Gustav Eisen insisted all the time that I could never raise figs without the wasp. One day we went out to Niles and found two or three caprifigs. They had plenty of pollen. We took the pollen out in my hand with a toothpick and put it into one of the figs imported by Mr. Rixford. We raised fifty figs. Mr. Shaw then wrote to Smyrna and got out a lot of Smyrna figs. I put them in the orchard in little boxes. Not being an entomologist I did not know how to take care of them. Mr. Eisen, from Lower California, sent me half a dozen boxes of the blastophaga. I put them in the trees and I think either from the California or the Mexican or the Smyrna came the blastophaga in that orchard. I was so unfortunate later as to have to surrender my ranch to Mr. Gage. It was due to Mr. Swingle and Mr. Rixford to recognize the value of the orchard. So far as I am concerned, my effort was to grow the Smyrna fig through the blastophaga and the seedling. I was a sort of a pioneer without much knowledge of the question. (Applause.)

MR. RIXFORD. With Mr. Maslin's permission I would like to make a correction. It was in 1883.

PRESIDENT JEFFREY. Mr. Kohler of Selma has been asked to speak on curing figs.

MR. KOHLER. I am in a peculiar position. I am a good deal like this gentleman that has just spoken. I did not know much about it and have been trying to learn, and when I run across such men as Mr. Rixford I find that I have learned a whole lot that is wrong and I don't know what is correct. But I raised a few of the figs this year, and after I put them in the sweat box my wife was looking over some one day and she found a number that were sealed up. I saw the one that Mr. Rixford had last year; and the wax had come out and seemed to drop over, but this was sealed up and looked transparent. I forgot to send them to him and I don't know what trees they came off of, but another year I will observe closer and watch for those trees. I cured some, and I believe in the pure sunshine and no dope on them. When they drop off they get a little dirt and I wash them in cold water with a very little salt. I imagine that the salt gave them a bright, glazy color, and then to get them in the proper condition I put them in the oven, and the oven I had 125 degrees hot, and kept them in there four or five minutes and packed them. They told me my method was impracticable and I told them it was not, because I could fix an oven and a dryer just as easy as they had it on a carrier going through hot liquid. There was a Swiss-Italian that gave me this idea, and he told me that if there was anything that he understood thoroughly it was figs and oranges, and he told me that the figs that they packed in New York they used a sort of an acid and they had an acid taste to them, but Mr. Rixford tells me the good figs are not thus packed, so he must have been wrong. I have been buying caprifig trees for three or four years, and I have got all kinds of trees. I don't know what they are going to bear, but I have got all kinds of shapes and all kinds of trees. It is something I don't know much about. (Applause.)

MR. RIXFORD. There is about one fig in fifty, generally, that is self-sealed.

PRESIDENT JEFFREY. Mr. Elmore Chase will speak on our trade in Smyrna figs.

MR. CHASE. The undried figs. I have not done any very big business in that matter; I am just starting in the business. Mr. Rixford has helped me considerably. I bought, something like ten years ago, twenty-five figs from Mr. Roeding, and he sent me two caprifig trees and one of them has borne figs, but I don't get any blastophaga, and this year the caprifig tree has raised a large number of mamme, but they all dropped. I received a large number of the profichi figs from Loomis. We hung them up in our trees and even had a very good crop this year, but the later ones did not fertilize. By the way, my figs have been fertilized for four or five years, and I don't know how they were fertilized. I have had a fair crop for several years without the insect. I wrote to Mr. Roeding about that. He said, "Send me some figs." I sent him some and he said, "You are fortunate. The bugs are about you somewhere." I took the figs, some two or three hundred pounds, this year from a few trees. We made a weak brine, dipped them in the brine hot and then cut them open—I can't explain just the process, as my daughter did it—and packed them in fancy boxes and carried them to Sacramento, and they had never heard of these figs before and it was hard work to get started. When I got started they sold rapidly. I sold most all of my Smyrna figs just as I picked them from the tree, carried them right down there and sold them green. In this way I have created with the Smyrna fig quite a demand from one firm, and they told me, "Next year we can sell everything you raise; the demand for them is great." Another process I took with the Calimyrna fig was to dip them, what we call candying them, in hot sugar and let them dry and dip again. The process lasts several days. Those bring as high as 40, 50 and 60 cents a pound, and that supply we sent down there went so quickly that they wanted more, but we did not have them.

PRESIDENT JEFFREY. I think the most remarkable thing about this entire discussing is that after thousands and thousands of pages have been printed in trying to discover who introduced the blastophaga—as much as has been used in trying to discover who hit Billy Patterson—now we find a pioneer, Mr. Rixford, who discovers that it has been here forty years. That discovery is not so remarkable as the fact that Mr. Rixford had the courage to say that all these discussions we have had for years have been a mistake, taking away credit from his own department and from a great many other men. I don't know how to account for this candor on Mr. Rixford's part in any other way than because he is a California pioneer. Now, Mr. Berwick has a few words to say.

MR. BERWICK. I have to catch this next train and I was just going. I was telling you yesterday that we had a grand opportunity of doing something. We have talked a great deal for five and a half years and this year our treasurer, Mr. John S. Dore of Fresno, is willing to help us out by going to Washington, and he is a man of some stir. I am tired of hearing people say, "Oh, it will come." Did you ever know a fig tree to come—even a barren fig tree—unless some one planted it? Did you ever know a house to get built unless some one built it? And if you want parcels post to help your fig business you have to do something. Mr. Dore is here and he will tell you what you can do, and I trust that you will be ready to do something more than talk at this time. Will you permit Mr. Dore to take my place?

MR. DORE. *Mr. Chairman, Ladies and Gentlemen:* I just came in your hall a few moments ago. I had no idea that my friend Berwick was going to thrust this upon me. The question, I see by the press, was mentioned yesterday, and my name has been connected with it just now, and I can tell you very briefly what I propose to do. When the Farmers' Union, a State organization, met in Fresno a few weeks ago I was selected by the State organization a member of the National Legislation Committee of that body, and one purpose in my selection was to push the parcels post, as we adopted very strong resolutions there, and because of that, perhaps more than any other thing, I was chosen.

Now, some say that little can be done here or at Washington; that we can pass resolutions and go home and come back next year and pass resolutions again. As Mr. Berwick has told you, for five or six years we have been doing that. We have made progress in the enlightenment of the people; we are more solid with the people, the producing classes of this country, because of the agitation, but we are not making much progress toward the establishment of a parcels post. The plan I have in view is this. A few years ago I met with the National Grange at Rochester, and this motion for the first time was adopted by that conservative producers' association, numbering over 800,000, and from that day to this the parcels post has occupied a conspicuous place in the national meeting of that great organization. Every state grange and all of the local granges and every paper of that organization—and there are many of them—have pushed it vigorously for the past five or six years. As I said before, it is a conservative organization, but after it has once planted its standard along that line it takes no backward step. The work for the rural delivery and for many other national movements has been pushed, and persistently, by that organization. As a result we have marched forward. The Farmers' Union, which has between two and three million people, largely in the Southern States, has adopted the same idea, and California, perhaps, was as vigorous as any in that line. During the sessions of congress the National Grange for many years has maintained a legislative committee, and a good share of the time it is in session in Washington; they have met with the President and the members of the cabinet, and before committees of congress they have not had a respectful hearing when they have asked to be heard. What I propose to do is this. I propose to meet, if I go to Washington, with the committees of the Grange and the Farmers' Union. I am personally acquainted with the men, or most of them—all of them on the Grange and most of them in the Farmers' Union. We will agree that we can push the parcels post along intelligent lines. And what are those lines? First, we will have compiled from the Congressional Record at the present session of congress, both senate and house of representatives, the action of every member upon every question relating to the parcels post, and publish that information in every congressional district in the Union. Aren't we making progress when we do this? I think so. And there is no combination of capital, no combination of interests that are antagonistic to this parcels post that can hinder our doing this, and we will place within the reach of the people of this nation exactly what we want, and we will show who are favoring the things that the farmers are calling for. I have yet to find any state or national grange, any state or national farmers' union, a single man or woman, to raise a hand or voice against this great convenience and great necessity of our civilization, as it has been in other countries, and, therefore, I say that when we have a concrete plan of operation that shall mean something and that shall tell our people who are their friends and who are careless or antagonistic or indifferent, we will have made progress. The question is as to doing it. It is with some degree of hesitancy or delicacy that I stated to my friend Berwick the situation. The Farmers' Union appropriated $250 for my expenses, but they did not have the amount in the treasury. There was a misunderstanding and it has come back to the National Convention, and then the question came up whether we should be there or not. The master of the National Grange, ex-Governor Batcheller of New Hampshire, has pushed this matter earnestly. More than one page of his speech each year in his annual message has been devoted to the parcels post, and in the discussions it has occupied a larger space than any one question for four years. Ex-Governor Bell of Vermont, another member of the executive committee of the National Grange, is also in line and working and has worked, and while occupying the position that he has in the grange, has missed no opportunity to push to the front in an effective way the demands of the producers of this country for that great convenience. Aaron Jones of South Bend, Indiana, another member of that committee and past master, is a sterling farmer who visited California and spent some time at my home. I have had frequent correspondence with these gentlemen and we have exchanged views in regard to this question, and I tell you that there is no reason why the farmers and the fruit growers of California shall not make their voice heard, and I tell you when the representatives of those two organizations, through their legislative committee, stand before the committees of congress, when they stand before the world, publishing the name of every man there, and no man has any right to question or dispute the right of the people to publish the record. Let the people understand this and it will right itself in a little while. There will be no injustice, there will be no wrong done any member of congress, nothing that is unfair. On the contrary, it will save them from misrepresentation and from any and all wrongdoing on that side of the question.

I have occupied more time, Mr. Chairman, than I should. I had no thought of speaking at this time, but I will offer, before the close of the meeting, some resolutions touching this matter and voicing, as I hope, the sentiment of the fruit growers of California upon this subject. (Applause.)

A recess was here taken until 1.30 o'clock P. M.

AFTERNOON SESSION.

The President called the convention to order at 1.30 o'clock P. M.

PRESIDENT JEFFREY. We will now have the pleasure of listening to Mr. Ashley on the subject, "San Joaquin County Grape Growers' Association." (Applause.)

MR. ASHLEY. *Mr. Chairman, Ladies and Gentlemen:* I want you to be a little lenient with me. I am not a public talker. As to my subject, I want you to be a little lenient on that, because while I have been growing grapes nineteen years, we have only been in this work one year. There are lots of things we do not understand. If there is anything in what I say that seems to be at all out of the way, understand it is from a grower's standpoint and nothing personal is intended.

CO-OPERATION FOR THE BENEFIT OF THE PRODUCER.

By George W. Ashley, of Stockton.

Organizations, associations and corporations without number have been formed and are still being formed for the benefit of some one. The greater number of these go to pieces on the rock of adversity. In those that are successful the smaller stockholder or member is usually frozen out and the profits go to the few. With few exceptions those that are successful are conducted on a commercial basis and the profits are divided up according to the number of shares of stock held by their fortunate owner and not according to the products handled for the party that grew them.

In a list of the few exceptions to the above rule and getting down to those of closer interest to the fruit growers are such bodies as the California Fruit Growers' Exchange of Los Angeles, the Hood River Apple Growers' Association of Oregon, The Yakima Fruit Growers' Union of Washington, The Georgia Fruit Exchange of Georgia, The Southern Texas Truck Growers' Association, and several others. These have for their chief object, not how large a per cent they can pay on their stock, if they have any, but how much per box they can return their members for their fruit? How cheap they can buy their supplies for their members? How well they can watch legislation, both state and national? How they can better distribute their products? How they can open new markets, and first, last and all the time how good a box of fruit they can put up? The time has gone by when the fruit grower can work under the old Roman maxim of *caveat emptor*, "Let the buyer beware." The one for the future will be, "The seller must make good." The chief road to prosperity for every successful fruit organization will be good goods. *Make the brand good in every market.* Fire out the careless and unreliable grower or else have your contracts so ironclad he must come through with good goods. So much for fruit organizations in general.

Now for our own experience in the San Joaquin County Table Grape Growers' Association. There were several causes for the starting of our association. One of these, and I may say the chief one, was the fight by the importers to reduce the tariff on the Almeria grapes. You all know the result of this fight by which the tariff on foreign grapes was raised 25 per cent. This was accomplished by our congressman, more as the result of the action of a committee appointed by the State Fruit Growers' Convention of two years ago, than to the action of any one else. We may, however, all have helped a little. This question, however, called together the grape growers of our district many times and resulted in the formation of an association.

This association held quite a number of meetings, and discussed whether it would only work along the lines of legislation, cheaper supplies, and a better pack, or whether in addition it would conduct a general shipping business. Finally, the more radical element won, and it was decided to undertake all things connected with the picking, packing, and marketing of grapes. When this decision was reached, it was thought best to change from an association to a corporation. This was done, but we still retained our association name.

In order to carry out our aims we knew we should have to have money. How to obtain this was the question. In order to allow the smaller grower to come in and feel protected, our shares had been placed at $25 per share, payable in five annual installments. The number of shares had been limited to one for each person. Therefore, to get money we knew we would have to borrow it. We decided to adopt a marketing agency and get our funds from them. On the question of a marketing agency our board of directors, and also our members, were pretty well divided up, and possibly here we made our first mistake of adopting two firms doing business in the same territory as our agents. But we did this. With our selling agents adopted we were enabled to get money for our members to buy their supplies of shook, sulphur, nails, etc., at a reasonable figure. The majority of our growers had paid 12½ cents for shook and baskets two years ago and 10½ cents one year ago. They wanted it cheaper, and by getting together and buying one half million in a bunch we got a much lower figure. In this one item we saved our members between five and ten thousand dollars. In labels on the number ordered we saved from $750 over their price in small lots. In sulphur we bought so cheap that more than one store asked us to buy for them. Nails we got at bedrock prices.

We secured money for those that needed it at a very reasonable rate of interest. We built two good sized packing houses and one smaller one. We did not require all of our members to pack in these, as we regarded them in a way as experimental. Instead of running them ourselves at first we let the contract to a firm at a fixed price under a heavy bond to run them and load our cars. This may or may not have been a mistake. We ran them ourselves the last part of the season, and the majority of our members will insist on this way next year, though whether it will be by the crate or by the time taken to pack a crate I am unable to state. The greatest objection to a fixed price per crate for packing is that the grower with good grapes and the careful picker has to pay for more than his share.

Our work this season has shown conclusively that only by the closest inspection can you secure a reliable pack of grapes and this inspection is much more easily secured at a central packing house than otherwise. For while the majority of members are honest, conscientious and fair, in the minority are some who do not possess these qualifications and a few who are actually dishonest. These few will kill your brand. You can not carry out your motto of "Make the brand good in every market," with these few putting in undesired, improperly picked, culled or packed fruit, handled carelessly. To have an inspector present at every growers' packing house is impracticable. We had at our busiest time four outside inspectors and two house inspectors, and they got so they could turn a crate upside down and take the baskets out in a scientific manner. In addition to these, we had our own man in the East to report on the packs and condition on arrival, etc.

As some remuneration for what we have done in this line we have received several encouraging letters, one of which says, "For a number of seasons past the Lodi pack of grapes has been gradually deteriorating. In nearly all markets there was a prejudice against the shipments from Lodi and a preference shown to some of the other points on account of the more careful grading and packing. We know it has been the object of your association to improve the pack, and we are pleased to note that considerable has been accomplished along these lines, and a good deal of the prejudice has been eradicated. We feel confident if this work is continued it will only be a question of a little time until Lodi will stand at the head of the list."

All of this inspection had the effect of shutting out many cars of inferior grapes. Not as many as we should have shut out, but quite a considerable number, at least 50, possibly 100. In comparison to this, we of the Lodi district had the same old game to contend with of the commercial companies accepting any and everything offered in the shape of a crate of grapes. And here we take occasion to say that our association might never have been in the shipping business had these same commercial companies ever shown at Lodi any disposition to inspect or hold down the poor f. o. b. pack. Their system in the past has been a premium for a poor pack. We are pleased to note there is some disposition to remedy this next season.

Returning to our marketing agencies: With one of these, Denney & Co., we made a contract by which they were to receive as their commission, not a flat rate per cent, but so much per cent above the auction charge in the East. Our reason for this was that the auction charge varies a great deal in different cities, and we thought possibly we would get better distribution if our agent received the same per cent no matter to which city he sent our cars to instead of getting 5 per cent net in some large city and 2 per cent in some small one. We believe that this system would greatly aid distribution if adopted by others.

Under the present systems, our organizations find that growers' fruit is sometimes used (and I may say quite often) to fight other people's battles with, the grower receiving no advantage thereby. If the different firms wish to fight, why not use their own fruit? Our instructions to our principal agent, Denney & Co., was that if any one wished to fight to let them fight, but to keep our fruit out of it, to only drop them when other people had already dropped. Otherwise go to auction. In connection with this, however, Lodi district and our organization in particular wishes to give notice to the various other districts and the various commercial companies that another season we are not going to sit around the first part of the reason while prices are good and let some other f. o. b. district drop its prices 10 cents per crate for a whole week, as was done by one district three times this season while Lodi held an umbrella over it. Whenever it is necessary to drop the price, it must be for the whole Tokay belt.

As an association there is a situation that we realize we have got to meet. It is the marketing of 10,000 cars of table grapes from California. This to be done in the same market and at the same time that they are marketing 10,000 cars of Michigan, New York, and Ohio grapes, Washington and Idaho prunes and Eastern and Colorado fruit, all under present conditions to be used up in a short time. This can best be done by organization, whether it be the getting together of the various commercial companies or whether the growers are forced into a growers' organization.

We have got to get our grapes on the market for less money, and we have got to get some way of extending the marketing season. I do not mean for less money than has been received by the grower this year, but at less cost with better distribution and with fewer rejections. At less cost, I said. Our freight and refrigeration charges to some points are exorbitant. The railroad tells us that one reason we have to pay so much freight is because they have to bring the cars back empty. Now, if this is a fact, why did our association have to refuse to load cars that were so strong with carbolic acid, salt fish and smoked meat we were afraid to put grapes in them? Why did we load numerous cars that had been previously loaded with cement, merchandise, and provisions? At less cost, I said! Why should we pay the same freight charges to Salt Lake and Denver as to Chicago? It is less than halfway. Why the same freight charge to Salt Lake and Denver as the orange grower pays to New York City? Why the same refrigeration charge to Salt Lake as to Denver.

Now, consider distribution from two sides, one of getting of the fruit into more cities, the other the act of not getting too many cars into the same city. Without better organization this can only be remedied to a small extent by the exchange of billings and divisions. The rejection of cars by buyers because the market has gone against them should be reached in some manner, and can only be reached by organization of some form. For if one firm has a car sold at 65 cents per crate and about the time it arrives another firm comes along and offers one for 45 cents, the commission firm that bought at 65 cents is very apt to ask for a reduction on account of some fly speck he has found.

With these 10,000 cars of grapes to market our association realizes that we have got to give up the idea of fancy prices, especially from young vines and from some localities, and be willing to put our grapes out in the West and Mississippi River country at a price based on a reasonable rate of interest, on a reasonable investment with a reasonable freight rate. Under those conditions we would open up new markets, send the Eastern grapes back where they belong, and by only putting our choicest grapes in the far East we would make some money for all. But we can not pay $346.50 freight and refrigeration for a 1,000-mile haul and do it.

One thing our association learned is that in many of the auction markets the receivers, when the markets are bad, bid in the grapes for the companies they are acting for. There is no question but what this has a tendency to steady the market. But this same receiver by taking the chance will in nine times out of ten make five times as much as the grower does who has spent a year raising it. If a large organization had its own agents to cut up these cars it would add quite a sum to the growers' profit. The danger now of putting car loads into small cities is that half a dozen others may do the same thing and the market get demoralized, the fruit old, and everybody disgusted. The distributors' organization of Sacramento has done much towards distributing the fruit properly, but it does not go far enough. It should control the f. o. b. price of its different companies in all the districts it buys in and it should have some form of inspecting, and stand only for good goods. As long as the distributors do or do not do these things, and as long as the majority of the independent companies are price cutters, it looks as though the growers themselves, through a state organization, would have to take these various matters up. The orange growers of the south had to do it; the Georgia peach growers had to do it; the Oregon and Washington apple growers had to do it, and why should not the grape and fruit growers of northern California do it? Why should they pay large sums as dividends on stock held by fortunate individuals? Why should they have to pay exorbitant prices for shook? Why should they have their fruit selling through half a dozen agents in a town, cutting each others' throats? Why should there not be some form of inspection by which the poor fruit is kept at home? Why should there not be some organization of grape and fruit people to work with various other organizations in other lines to have some effect on legislation and rates? Why should there not be some organization to put into effect in a commercial way the storage of Emperor grapes for later sale and keep them out of the way of the Tokay? Why can not we have some coöperation for the benefit of the table-grape producer?

We, of the San Joaquin County Table Grape Growers' Association, have tried some of these in a small way, and have been reasonably successful. Why can not other districts do the same and then all get together under some central organization, no matter what its name is?

I said we have been reasonably successful. We shipped some 300 cars, and would have shipped five or six hundred had it not been for the poor prices and early rains. We sold grapes in thirty-seven different markets in car load lots, besides shipping to numerous towns in small lots. We shipped grapes from the Sandwich Islands to Florida, and are ready to compare prices with any one of the same grade of fruit.

We do not claim that we have not made mistakes. We have made them. Some we have rectified. Some we will not make again, others we may make in a different form. Still we are hopeful, and buyers are beginning to ask for our pack, and over 250 of our members have signified their intention of going on next season.

One thing we are ready to do, and that is to coöperate with any one that we believe can help in any way to increase the amount received and lower the amount of cost to the grape and fruit grower. I thank you. (Applause.)

MR. STEPHENS. I would like to ask one question. How many members are there of your association?

MR. ASHLEY. There are over 250 paid up for the next year already.

PRESIDENT JEFFREY. The Committee on Seeing the Valley has asked me to have you pass upon the program for to-morrow. The committee does not think it will be possible, owing to the rain, to make that excursion, and yet they do not want to call it off without the authority of the delegates of the convention, and if you feel that it will be a failure to try and get around to-morrow in the mud, and the committee feels that way, I would like to entertain a motion that we cut that out of the program to-morrow and use the time in convention.

MR. DARGITZ. I make a motion to that effect.

The motion was duly seconded and unanimously carried.

PRESIDENT JEFFREY. The next thing on the program now is the report of the California Fruit Distributors, by Frank B. McKevitt, the manager of the organization known as the Californa Fruit Distributors. (Applause.)

REPORT OF THE CALIFORNIA FRUIT DISTRIBUTORS.

By F. B. McKevitt, Sacramento.

The fruit season of 1909 is distinguished from all others by the fact that never before in the history of the industry has the movement of fresh fruit to outside markets been of such great volume, 15,265 car loads having been shipped, nearly 2,400 more than in 1908.

It might be inferred from this heavy shipment that the deciduous fruit crop of the State was unusually large, but this would not be true, the crop of some varieties and of some localities having been quite short.

Last year the crop was very heavy, and owing to the season being comparatively dry, there having been practically no spring rains, the fruit did not attain full size, and trees especially showed the effect by a lessened growth and poor bud development. This was true more particularly in the localities where irrigation is not practiced, but to some extent was the case almost everywhere in the Sacramento Valley. In the spring the setting of fruit showed an almost total failure of apricots, light crop of cherries, and a half crop of peaches, pears, and plums. Owing to the abundant rainfall, fairly satisfactory cultivation, and the fact that the crop was short, it was estimated that we would be safe in providing for an output of these varieties which should be about seventy-five per cent of last year's shipments. We have, however, done better than that. In the San Joaquin Valley all tree fruits excepting apricots were full crops, as were also grapes.

CHERRIES.

The first car load of cherries for the season was shipped May 8th, and was forwarded by freight. The first car for 1908 was shipped May 25th, which was unusually late, the records showing first car lot shipment in previous years as follows: 1902, May 13th; 1903, May 9th; 1904, May 13th; 1905, April 22d; 1906, May 2d; 1907, May 5th. All these first shipments went forward from Vacaville.

A total of 249¾ cars of cherries were shipped, this being 41½ cars more than in the preceding year. As has been stated before, this did not result from a larger crop than in 1908, but the canners and other factors, which are usually purchasers of this fruit, were not much in evidence; the Eastern market was good, and the result was the increased shipment. Prices were very satisfactory. Practically all these shipments were forwarded by the regular freight service, which proved perfectly satisfactory, and was infinitely cheaper than express.

APRICOTS.

Apricots were almost a total failure in the early sections, but were better in Santa Clara, and a fine crop south of Tehachapi. There were, however, nearly as many cars shipped as in 1908, when the crop was the heaviest known for several years, the shipments for that year being 231¾ cars, while that of 1909 was 208¼ cars. Prices were very satisfactory.

PLUMS.

The plum crop, while very good, was not heavy. Trees of this variety showed wonderful qualities of endurance and productiveness, some trees which were so loaded with fruit the preceding year that the product was too small for shipment, and whose buds were inferior and poorly developed, surprised the most experienced observers with a good crop. Our plum shipment reached a total of 1,526¾ cars, or only 237 cars less than in 1908. Prices were unusually good. Our plums seem to be increasing in popularity everywhere, and are a very desirable fruit. Many of the so-called Burbank varieties resemble the Bartlett pear in having the exceedingly valuable property of ripening up beautifully and developing an exquisite flavor when picked green. This is true particularly of the Climax and Wickson.

PEACHES.

The peach shipments were quite heavy for California, a total of 2,599 cars going forward, or 620 more than last season. The quality of the fruit was not very good, much of it being small and inferior, and in some localities was very wormy. Owing to the shortage of this variety in Eastern fruit growing centers a strong demand was anticipated, thus undoubtedly causing the shipment of a quality that should never have been permitted to leave California in its fresh state. Prices were low on the major portion of the shipments, and returns to growers were very small. To add to the misfortune, there was a car famine that came at the height of the season, some of the fruit lying on the loading platforms and in the packing houses from twenty-four to seventy-two hours, thus causing it to arrive at destination in a soft and overripe condition.

PEARS.

The Bartlett pear crop was very good, and the quality of the fruit was unusually fine, being of good size, and free from scab and other defects. Winter pears were generally a short crop. Shipments were 2,638 cars, being exceeded by those of the preceding year by 63 car loads. Prices were generally very good, owing to the fact that the crop was almost entirely sold at a time when the Eastern markets were nearly bare of domestic fruit of all kinds, and especially of this variety. The reason for the heavy Eastern shipment of pears is to be found in the absence of demand on the coast, the canners who are usually heavy buyers being practically out of the market until the bulk of the crop had been moved. This variety is undoubtedly the most popular of all California fruit, and for eastern shipment we may well call it "The King of Fruits."

GRAPES.

The grape shipment in 1909 exceeded that of any previous season by more than two thousand car loads, the total for the season being 5,875 cars, while that of last year was 3,812 cars, a gain of over fifty per cent in one year, and it is probably true that there were more than 1,000 additional car loads available had the demand and condition of the fruit justified shipment.

The grape market was satisfactory until about September 15th, covering the sale of upwards of 1,200 car loads, but after that time prices were low, and in the great majority of cases showed no profit to the grower. A reason for the low prices is to be found in the fact that not only was the shipment from this State very much heavier than ever before, but unfortunately it came into direct competition with a very heavy crop of grapes and peaches grown in the East. A conservative estimate made in our office early in August indicated an output of upwards of twenty thousand car loads of peaches and grapes alone from Michigan, New York, and Ohio, this fruit nearly all crowding into the market between September 1st and October 15th. As there were also great quantities of apples, pears, plums, etc., coming in at the same time, making an enormous aggregate of probably more than one thousand car loads per day, it is not to be wondered at that California growers, handicapped by the high cost of labor and transportation, have no profit to show for these late shipments.

APPLES.

Apples are not handled by this organization, so that no report on this crop, which was fine and profitable, will be made here.

SERVICE.

The refrigerator-car service maintained by the Southern Pacific Railroad Company has proven very satisfactory. The management is in able and experienced hands, and we have found hearty coöperation in all endeavors for the benefit of the service. The only blot on the otherwise splendid record of the Refrigerator Car Company was the car shortage, which came in the height of the season. While disposed to criticise severely at the time, and criticism was certainly due some one, for adequate provision was not made even for the estimated shipment, still we must admit that most of the trouble was caused by the exceptionally large offerings, and we must give credit, too, for untiring exertions on the part of the company to remedy these conditions as soon as they realized the necessity for so doing.

RAILWAY SERVICE.

Local railway service from shipping point to Roseville, where through trains for the East are made up, was very unsatisfactory, owing to a number of causes unimportant in themselves and which we hope will be overcome another season. From Roseville to the East service has been almost uniformly good, although we contend that the running time between here and the East should be cut down from 160 hours, present schedule, to 147 hours, thus enabling fruit to be sold on the seventh morning in Chicago. A very slight increase in the speed of trains would make this gain possible, and it is one of the many betterments that the California Fruit Distributors are making a strenuous fight to obtain. The Santa Fe Railroad proved a good friend to the fruit men this year, not only loaning to the Southern Pacific Company all the refrigerator cars that could be spared from their own business, but putting into the Sacramento River service their fine steamer, making it possible for the Southern Pacific Company to handle expeditiously the exceedingly heavy pear and plum business of the river section during the month of July.

A very considerable amount of fruit was shipped East over the Santa Fe lines during the season, and the service was the best ever received for California fruit, their running time from Fresno to Chicago being

151 hours, which schedule was almost entirely maintained during the season.

RATES.

The question of rates is a most important one, and the distributors have labored constantly to help the growers of California secure such concessions as would put the industry on a safe and paying basis. At the last Fruit Growers' Convention a transportation committee was appointed to consider this matter, and I want to heartily commend the splendid work it has done. The committee has been untiring in its efforts, and has collected an array of statistics which are a revelation.

We had hoped to be an effective agent in aiding the growers obtain the desired relief, and to that end we sent a representative from California to attend the recent meeting of the Transcontinental Traffic Association at Chicago to urge upon the representatives of the transportation lines at that meeting the absolute necessity of granting us the so-called "postage-stamp" rate of $1.15 per 100 to all points in the East. Owing to unexpected opposition in some quarters, we were unable to obtain what we asked for, although we must give credit to the Southern Pacific and the Santa Fe representatives for what we believe to be a sincere wish to secure for us the desired rate. A considerable concession, however, was obtained, as can be seen by comparing the old rate with the new one that has been promised:

New York, Boston, Philadelphia, Baltimore, old rate, $1.45; new rate, $1.40; and on peaches and grapes, old rate, $1.45; new rate, $1.25.

Buffalo, Pittsburg, Cleveland, old rate, $1.35; new, $1.30; peaches and grapes, old rate, $1.35; new, $1.25.

Detroit, Cincinnati, Indianapolis, old rate, $1.25; new, $1.20; peaches and grapes, old rate, $1.25; new rate, $1.20.

Chicago, St. Louis, Minneapolis, St. Paul, $1.15. No change.

It is a great disappointment that our just demand was not granted, but as the rate asked for is absolutely essential, we will continue our efforts, and that ultimate success will be achieved we do not doubt. Even as it is, however, had the present crop been handled on the reduced rate, a saving of over $200,000 would have been made, which sum put into circulation among the growers would have tended to alleviate some of the heartaches.

In making a comparison of the shipments of this season and last it is to be seen that the gain of nearly 2,400 car loads was made entirely in peaches (gain 620 cars) and grapes (gain 2,059 cars), other varieties, with the exception of cherries, showing a decrease. Heavy shipments of peaches were made from the San Joaquin Valley, where the crop was fine, more than overcoming the considerable shortage in shipments of this variety from Placer and other sections, and creating the excess of 620 cars. A considerable part of the increased grape shipments came from the Lodi district, where the acreage of table grapes is very extensive, but all parts of the State contributed in proportion. In the Lodi district a larger percentage of the output was handled by shippers outside of the California Fruit Distributors than ever before, and the San Joaquin Valley was an inviting field, not only for these firms, but for several new ones who tried their hands at the game, and it is a significant fact which may or may not be related to this condition that it was on these two varieties that no money was made by the growers. We fully believe, however, that could all of this business have passed through one channel, results would have been far better. Competitive shipping from California is the Eastern dealer's opportunity, we can not blame him for buying at as low a price as possible, but as our bread and butter depend upon securing a reasonable price for our products, we certainly are very shortsighted if we do not make every effort to protect our interests. It is quite customary for dealers to wire us that so-and-so is quoting fruit for a less price than we are asking, and we have do doubt that he is saying the same thing about us to our competitors, and we are told that it often happens that he makes his bluff work, and succeeds in buying at a lower price than was established, when in all probability the original price was fixed as low as it could be and show a living profit to the owner. If all fruit was sold through one channel such things as this could not be done, and the further we get away from this idea, the nearer we get to calamity. With the limited output of the past this danger was not threatening, but with the wonderful increase of the past few years every thinking and conservative grower must recognize the fact that we are drifting towards the rocks, from which nothing can save us except united and harmonious effort.

Much misconception of the object and aims of the California Fruit Distributors exists in the public mind, and there are some growers who have been taught to believe that the organization is a trust, formed for illegal and ulterior purposes, but the truth of the matter is that no enterprise ever undertaken in the fruit business has done so much to advance the interests of the whole industry as this. We have long since passed that stage of our business when our fruit could be sold to good advantage anywhere—now we must give the most careful consideration to each market, study its peculiarities and requirements, and then give to it only so much, and of such kinds as it can handle at paying prices. This is what the California Fruit Distributors are trying to do; what they are doing, so far as it can be done by any organization which does not handle the entire output. With a considerable volume of business passing through other channels, the destination of which is unknown to us, we are necessarily handicapped in our efforts for perfect distribution and maintaining of prices, unavoidably resulting in an occasional glut of auction markets and a lower range of f. o. b. values, all of which is productive of loss. It is not necessary to ask upon whose shoulders must fall, not only the direct loss so occasioned, but worse still, the depreciation of land values, which always is sure to follow when our business is no longer profitable. "United we stand, and divided we fall," is just as true of the fruit business as of our national government, and is a lesson that fruit growers must learn before our industry can be placed upon the high plane of commercial success. (Applause.)

PRESIDENT JEFFREY. The next address will be, "A Grower's Marketing Agency," by W. C. Walker, manager of the California Fruit Exchange, Sacramento. (Applause.)

A GROWER'S MARKETING AGENCY.

By W. C. WALKER, of Sacramento.

The old truism, "Necessity is the mother of invention," can very appropriately be used as the text for a discourse on the question of a grower's marketing agency. It has been well said that history often repeats itself, and I hope in this paper to offer food for thought and the discussion of a similar problem, if not the identical problem that confronted the growers assembled at the State Fruit Growers' Convention held in San Francisco, December 5, 1909. At that meeting the growers of tree fruits grown for Eastern shipment were in a dilemma, and as a result of a general admission all round that the situation was indeed serious, a resolution was adopted as follows:

> WHEREAS, It is a fact that unless measures are devised to relieve the present situation, the greater portion of our shipping fruits will have to be worked over into drying or canning varieties, thus relieving us of one great outlet for the products of our orchards.

At that time drying and canning fruits, also table grapes, were in excellent demand and the only real dark outlook was in shipping fruit. We have lived to see all three fruits mentioned reach a marketing stage more serious than shipping tree fruits. We have had the pleasure of seeing the organization which was created as a result of the resolution, develop a market not only for the crops then in peril, but ship canning varieties East successfully the past season—a dried fruit agency formed and patterned along the same lines successfully marketing raisins and dried fruits, and we hope to develop a way for making our table grapes more profitable.

A committee was appointed to prepare a form of organization. The committee met in Sacramento, January 16, 1901. The name adopted was the California Fresh Fruit Association.

A later meeting was called at Newcastle, where the committee made its report, and as a result associations were formed at Loomis, Newcastle, and Penryn. The associations were formed for the purpose of gathering the fruit and loading it into cars for market; each realized that individually they would be almost powerless in the markets against the many rival concerns then engaged in open warfare, and a competition which if continued would have meant ruin to many growers as well as those engaged in the shipping business. Therefore, a marketing agency or exchange was needed for obtaining orders, distributing, and selling the fruit. The result was on May 1, 1901, the California Fresh Fruit Exchange was incorporated as a marketing agency for the various growers' associations. It had no jurisdiction in local affairs, but had merely to do with finding markets. This arrangement was wise and needful, for should the control be from the central organization, the exchange would become all powerful, and the master instead of the servant. It has worked out that the associations to-day are all powerful, and the exchange purely a marketing service with the ownership and control so widely distributed over northern California that any danger of a few getting hold of the government of the organization is averted, because the same is vested in representatives from districts several hundred miles apart. The directorate is made up from the various associations, and they are all so anxious to maintain it as a purely marketing agency that our sphere in life has been well defined and established.

The working of the exchange resolves itself as follows: The local associations gather the fruit of their own locality, supervise to some extent the packing, the distribution of shooks, the loading of cars, etc. These associations turn over to the exchange the loaded car. The bill of lading and papers are forwarded to the Sacramento office; the exchange finds a market for the product, collects for the same, and returns to the local associations the checks for the growers, and the local associations in turn pay their members. The operation is quite simple, and from experience it has been found that it is advisable to follow the above procedure.

It would seem that returning to the grower all his fruit would bring, the distribution of market information, etc., the exchange would have nothing but a smooth road to travel on, but obstacles were encountered, and some of them seemed almost insurmountable. The first was in regard to the matter of obtaining box shook, packing houses, pay for the help during the season when no shipping was being done, loaning of money to growers during the winter, etc. It was also discovered the growers organized in Placer County to market their own fruit did not have a complete list of assortments, and found from experience that in going before the trade of the country it would be necessary to have a complete assortment to successfully trade in the big markets. Therefore, it was necessary to reach out and do missionary work and teach growers to organize. All of this required money. How was it to be secured? The banks did not care to loan to the associations because they had no capital stock, and it was necessary for the association directors to put their personal signatures upon the notes to raise sufficient funds to do business. These amounts, as far as the local associations were concerned, did not total very much, but in the exchange the aggregate was considerable; in fact, so high that a good many of the larger growers would not serve as directors and take the risk connected with the loss when they had nothing to gain beyond the marketing of their fruit.

The above was the most serious obstacle ever presented. How could the growers finance such a big undertaking without any capital to start with? In other words, attempt to build something out of nothing. The outcome was the present organization known as the California Fruit Exchange, a coöperative stock corporation. The by-laws are so arranged that no one individual, partnership, association or corporation can own more than ten shares of stock, thereby eliminating the danger of control by a few persons, and at the same time overcoming the objection of the banks. On February 19, 1907, the old exchange was reorganized, and is now known as the California Fruit Exchange. Stock was subscribed for and promptly paid up, as a great many growers willingly purchased a share of capital stock then valued at one hundred dollars ($100). The local associations each purchased a share of capital stock thereby making the connecting link between the associations and the exchange. The results have been very gratifying, the banks have learned that the exchange is thoroughly sound financially, that it does not buy or speculate, thereby insuring a solidity; and the corporate notes have been accepted without requiring a few persons to take the big risk that formerly attended the financing.

In selecting the directors, it has always been the aim to pick one from each shipping association first and then make up the balance of the directorate from some of the old "stand-bys."

The annual balance sheet to December 31, 1908, showed an organization with a splendid surplus, and a record of having paid two dividends, and every prospect of a continuance of the same.

The dividends are disbursed as follows: first 6 per cent is set aside as a payment on stock, then 20 per cent of the net earnings for the first three years is set aside as a reserve fund. The balance is divided 75 per cent among all growers, or growers' associations, who have signed contracts and shipped consistently, in proportion to their gross earnings, and 25 per cent as a further dividend on stock. The first and second years we divided the balance half on stock and half on gross sales, but we recognized as a grower's organization the stock was earning too much, and changed it to increase the dividend on the tonnage as the stock was only intended as a means to an end and we desired the growers who produce the increment to obtain the benefit of it.

Our growth in tonnage during 1908 (the first year after reorganizing) was about 95 per cent (588 in 1907; 1,146 in 1908). The increase for the State during the same period was about 70 per cent (7,491 in 1907; 12,917 in 1908).

Our gain this year over last has been about 25 per cent (1,146 in 1908; 1,433 in 1909).

The State growth to the same date has been about 17 per cent (12,917 in 1908; 15,172 in 1909).

The growers' organizations with whom we have marketing arrangements are:

Acampo Fruit Growers' Association.
Acampo Christian Colony, through J. P. Dargitz.
Auburn Fruit Growers' Association.
Courtland Fruit Growers' Company.
Florin Fruit Growers' Association.
Fresno Fruit Growers' Company.
Linden Fruit Growers' Association.
Loomis Fruit Growers' Association.
Lodi Packing Company.
Newcastle Fruit Growers' Association.
Penryn Fruit Growers' Association.
Sacramento River Association.
Vacaville Fruit Growers' Association.
Winters Fruit Growers' Association.

We also have a marketing arrangement with The San Joaquin County Table Grape Growers' Association for members who desire to ship through us.

We also have agencies at Lodi and Vacaville. We expect both districts to become association points before long. Our agencies are withdrawn as soon as the growers organize for themselves; that is our only reason for an agency. We also market fruit for growers in several districts who operate individually and load their own cars. These associations and agencies represent practically every important shipping center in northern California, except the apple districts.

With the assortments we are able to give, coupled with a trained force of salesmen and a good knowledge of market conditions gained from several years' experience, we are able to command the best trade in the country. Our record of cars placed in the private-sale markets during the past two years is enviable. This system of catering to and building up the private-sale system has been the means of returning to growers marketing through us good returns in the face of the depressed market conditions of 1908 and 1909.

We shall now take up the matter of distributing the fruits in the markets. This feature embraces a very large field. The present marketing system of the exchange is the outgrowth of several years' experience. The marketing of deciduous fruits necessitates considerable detail, on account of the many varieties and the different districts in which they are grown. It has required careful study to find out the markets that will take certain varieties and the varieties that will stand transportation to the various markets. The country from Chicago east will take varieties of a different nature than the markets west of that city. This is largely on account of home-grown varieties in the East. Likewise, the markets of the north and those of the south take varieties that are unsalable at profitable figures east of the Rockies. In the marketing of California fruit we have to be most careful to avoid home-grown crops, as they are often preferred to the imported article on account of the quantity, ripeness, and low freight rates. We also find local prejudice often interferes in favor of home fruits. The territory east of Chicago is practically all under the auction system, and that north, south and west under the private sale. After very careful consideration, we determined to make two central points—Omaha for private sale and Chicago for auction. This system has proven very satisfactory, especially at the loading points, where the association manager is able to take certain varieties and put them into cars that he is sure will go to auction and other varieties that will meet with good sale in the West.

We aim to assort cars at all time to suit the Western market, and in this way develop distribution. This assorting requires a great amount of detail. We ship a great number of part cars from one district to another to assemble the required assortment. If the car is delayed it requires a careful inspection, so as to keep the fruit that has ripened out of Eastern cars. In filling orders this year we assembled a great many cars at additional expense to ourselves. But the cars thus assorted usually were accepted at satisfactory prices and more than repaid the local freight and other expenses.

We furnish circulars regularly to our agencies, showing the time varieties will be in season. We also issue a circular each year giving a very complete list of the estimated ripening dates and time shipments will begin and end. The agents by following the same are in a position to tell their trade ahead of time just about the varieties to expect and thus be in a position to calculate on future requirements.

The packing is all done at home or in the orchards, with the exception of Fresno, Acampo, and Lodi where some of the fruit is hauled to the shipping houses in lug boxes and there packed. The house managers endeavor to inspect all packs as delivered and reject when below standard. We make a special effort to load all fruit the day it is received, our aim being to deliver to the railroad company fruit in prime condition. The managers of the shipping houses endeavor to ship nothing but hard, good-keeping stock; fruit that is too ripe is sold locally, as there is usually a good demand. We approve the recent standardizing plan as we know its need. In fact, we have practically been doing the same thing in our own way for several years.

The day following the shipment a telegram, giving full details of each car, is sent to our general Eastern office, which in turn advises the agents promptly. Thus they have full knowledge of all fruit rolling. Time is a great element in the handling of deciduous fruit, owing to its very perishable nature. This calls for prompt action along the line. We know the individual growers, and definite advice from the Eastern markets as to packs gives us an opportunity to reach the grower and correct the fault in future shipments. Detailed reports received collectively point out faults which could not be detected individually. If three or four points complain about a certain grower's pack, we know the fault lies at home and not with the transportation or refrigeration.

Prices are made by the head office in accordance with the supply and demand on all cars except those sold at auction, where prices are determined by the purchasers. We have arrangements with the California Fruit Growers' Exchange to use their salaried agents at all points where they have same, and we select any broker we choose at other points. By conducting our sales direct with our agents we are in very much better touch with the market than by turning over our shipments to any other organization. Our present system keeps us in direct touch with the market without going through too many channels. In this way we are unhampered and our ideas of value are not dictated to or passed upon by any one but ourselves, and it is only natural to suppose, being a grower's organization, we hold out for the highest price obtainable. The prices on deciduous fruit fluctuate rapidly because of the number of States that produce this character of fruit, and by having a free and unhampered selling system, we are able to take full advantage of prevailing conditions. As an answer to our values realized, we have only to point to our successful growth.

We have followed the practice of having only one agent in any one city, believing the practice of dividing up offerings brings one's own fruit into competition with itself, which, to say the least, is detrimental. We make a practice of selling the cars impartially because we do not buy or speculate and the exchange has nothing to gain but the highest confidence of its membership, and in order to do this all must be treated alike. We consider our satisfied membership the best evidence that this has been the case. We have not lost a dollar on bad accounts in the East since 1902. We endeavor to make payment to our growers promptly, our average being about twenty-five days from the date of shipment, and to do this no time can be lost in making remittances.

As a general thing the account sales leave the office the same day the money is received, and a delay of five or six days in sending the check from an Eastern district will cause just about that much delay in returns to the growers.

The exchange charges its growers the usual commission and other prevailing charges. At the end of the season, after all expenses have been defrayed, whatever is left over is paid back in the form of a dividend, as previously explained.

We consider the advices received during the year to be worth a great deal. Our agents write about the markets, crops, weather, trade, etc., and the same in turn is given our growers, thereby enabling them to keep in close touch with the matters affecting their fruit.

We believe in viewing coöperation broadly and as a strictly business proposition. In fact, this system is putting the deciduous business in California on a strictly industrial basis without any speculative features attached to it. It must be obvious if the growers can not make a success marketing their own product through an agency well equipped and constructed on businesslike lines, there is nothing in the fruit business for the grower. We have found out to our satisfaction that the agency as we now have it is a success, and our growers, as a general thing, are successful. Therefore, we have great faith and confidence in the future of deciduous fruits from this State, and many of our growers, through careful study of prices realized on certain varieties and the time of shipment of other varieties, have grafted over portions of their orchards so as to make them profitable for practically the entire season.

In our annual meetings we have never been afraid to take up policies that we think have been wrong and thrash them out in open discussion. We have endeavored not to be selfish in our ideas, and the very democratic way in which our meetings are handled have in themselves been a great source of strength, because we obtain the combined intelligence of a great number of growers who we consider are the practical fruit men. In fact, our whole system resembles to a great extent that in vogue by this republic. The associations, we might say, represent the individual States and the exchange the Federal Government. The States attend to all their own local affairs, devise their own laws, have their own boards of directors, etc., and they delegate to the exchange or Federal Government the handling of their foreign relations connected with the business away from their own respective locality. The associations in turn send to the board of directors their representative, so that the board in turn becomes the house of representatives, and the widespread interests represented are in themselves a safeguard and a great source of strength to the whole institution. In fact, to say a coöperative concern can not succeed is as illogical as to say this republic is not a success.

We have tried to show the benefits secured the grower by coöperating, and experience has proven the following advantages:

A marketing agency owned by the grower, thus ensuring an avenue to market under the growers' complete control at all times. This in itself means the danger of a monopoly controlled by others than growers on fruit marketing is a thing of the past.

The full market price returned to its members.

The cost of marketing reduced.

The general pack vastly improved through the advice of the Eastern agents, thereby causing our fruit to command a better price.

This exchange is growing daily, and when our advantages are better known to growers in all districts we expect to have a very large growth and become the controlling factor in deciduous fruits from this State.

We have recited above what we consider the most important features in this deal, and trust they will bring forth a discussion that will be beneficial. (Applause.)

PRESIDENT JEFFREY. The next number, and the last on the program, will have plenty of time. I hope everybody here will put down what points he wants to discuss to-morrow. Mr. Stephens will come forward as the representative of the Committee on Freight Rates, and we will be glad to listen to his report. (Applause.)

MR. STEPHENS. *Mr. President, Ladies and Gentlemen:* I realize very forcibly that I do not possess the ability to present in a forcible and convincing a way as should be done the important matter which I am called upon to do. I doubt if anybody could do it, and I make no attempt at oratory or anything of that kind, but get down to business in my own awkward way.

To commence, I wish to say that for the first time, through conditions existing in the past year and the year previous, the shippers and the growers stand as a unit. There is no division in sentiment, no division in opinion, regarding the questions that are contained in this report. That is a very satisfactory condition to me and to all growers and it should be to all who take an interest in the future upbuilding and prosperity of this State. I wish to say in addition, regarding the work of the committee, that we have not been idle, that we have been attending to our duty for a year, and there was scarcely a week that we have not been engaged in presenting to the railroads arguments in favor of your contention. That has not been done without cost. We have called upon nobody to aid us in this respect. We have gone down into our own pockets to defray the expenses of the committee necessary in order to present your demands—at least, your request—to the transportation companies, the railroad officials, of the necessity of granting the relief which you have asked. That has not been any small sum, either. It will come nearer $350 to $400 than anything less, and yet we have not asked anybody to contribute towards this fund.

Inasmuch as there will be an opportunity to-morrow afternoon for discussing this and other questions that have been presented to you for consideration, it will not devolve on me at this time in any way to enter into such discussion.

REPORT OF THE FRUIT GROWERS' COMMITTEE ON FREIGHT RATES.

By R. D. STEPHENS, Chairman, Sacramento.

Mr. Chairman, Ladies and Gentlemen, Fruit Growers of California: Your committee on Freight Rates begs leave to make the following report and asks that you give to the questions therein discussed the consideration their importance demands:

In presenting the report, I wish to say in behalf of the other members of the committee, that they were ever ready and willing to do their full share of the work. They were anxious to do all things honorable that were in their power to win for you that which is justly due you. They believe that deciduous fruit shipments East should, at least, be placed upon an equality with the citrus shipments made from the southern part of the State.

When we entered upon the discharge of our duties, we believed that we would have but little difficulty in convincing the railroad officials that your request was supported by every principle of equity, and therefore just. Just, not alone to you, but also just to the railroads; just to those who, through promotion literature sent out (much of which was misleading and extravagant in its claims of profits made in fruit growing, by the railroads, promotion committees, large landowners and real estate dealers), were induced to sell their homes and holdings in the East and come to California and invest their all in growing fruit for Eastern shipment; just to those who, through honest and honorable effort, are trying to promote and build up the Sacramento and San Joaquin valleys; in fact, just to all legitimate interests.

We believed that the railroad officials did not understand the true condition of our deciduous fruit industry and the imperative demand that relief should and must come to it in order to save a large per cent of its growers from financial ruin. We believed all we would have to do would be to show them facts and figures to convince them that you were asking no more than you were entitled to.

In the discharge of our duties we soon realized that the purpose for which we have been selected was not so easily accomplished as at first it seemed it would be. However, having accepted the positions you so kindly tendered us, we felt that we were in honor bound to do all that our ability would permit us to do, to gain for you the relief necessary to place your interests upon a small paying basis. In the discharge of our duties we have spared neither labor nor expense. We have acted strictly from a conscientious standpoint.

In presenting your claims we have not indulged in the use of abusive language nor language that any gentleman could take exception to, but, on the contrary, have been more supplicative than otherwise. Neither have we dealt in generalities alone but, on the contrary, we have presented eighty-seven different railroad officials with data containing facts and figures in support of your contention, none of which, up to this time, have been proved to be incorrect.

I presume there are some present here from Los Angeles. The next question considered, then, will be of interest to the Los Angeles people, because it relates to the question of taxation—one, in fact, that we all feel interested in. We all feel that we are overtaxed, taxed more than we should be, to defray the expense of government; therefore, to those people of Los Angeles I wish to call attention to the fact that they are paying also heavy taxes, yet not in proportion to the deciduous fruit growers of the San Joaquin and Sacramento valleys.

TAXATION.

You have just gone through the ordeal of paying your first installment of state and county taxes, and no doubt many of you, if not all of you, feel that the rate of taxation for the support of the government is unnecessarily high and oppressive. That such is the feeling of the fruit growers of Placer County is evidenced by the speeches and the action taken by the growers at a meeting held at Loomis on September 19th last, at which Judge N. P. Chipman took a strong stand against the tax levied on fruit trees and vines.

Judge Chipman said, in part, "There is no greater iniquity than that tax. There never has been a more unjustified piece of legislation. Nothing can justify a tax on growing fruit trees, and by concerted action you should be able to accomplish much towards overcoming its evils."

I agree with Judge Chipman. The tax on fruit trees and vines is an evil which should be remedied at the earliest possible moment. There are many trees and vines that bring no profit to their owners; instead, the care and handling of their products brings a loss.

I believe the delegates in this convention should pass a resolution tendering Judge Chipman a vote of thanks for the firm stand he had taken upon this question. The only fault I have to find with Judge Chipman is that he does not go far enough on the question of taxation.

The deciduous fruit growers, whose products are shipped East to find a market, stand in a class by themselves as taxpayers, when the question of indirect as well as direct taxation is considered.

There is another tax—you may call it by whatever other name you please, and it will still remain a tax in character and in fact—which the fruit growers have to pay, that is far more oppressive and excessive in its demands than the one mentioned by Judge Chipman. This tax is levied by a self-constituted authority, which arrogates to itself the right to levy tribute, without consulting with or asking the consent of those who have to bear its burden, and there seems to be no influence or power sufficiently potent to restrict it in its demands. This tax, for it is nothing more nor less than such, is assessed against the deciduous fruit growers' products in the way of charges for transportation on their Eastern shipments.

I doubt if any one here ever gave this question serious consideration or realized the magnitude of this tax, which is being imposed upon the fruit growers of California, and which is particularly oppressive to the deciduous growers of the Sacramento and San Joaquin valleys.

In order to illustrate how this tax affects the deciduous fruit growers when compared with the state and county tax, I will call your attention to the following statements taken from the records; therefore, correct:

GROWER NUMBER ONE.

Charges for transportation on 53 cars	$22,648 00
State and county taxes	1,031 00
Excess transportation tax	$21,617 00

This grower pays $21,617.00 more tax for transportation than he pays for state and county purposes, or over 2,098 per cent more. His state and county tax amounts to over $19.00 per car.

GROWER NUMBER TWO.

Charges for transportation on 36 cars	$15,380 00
State and county taxes	503 00
Excess transportation tax	$14,877 00

This grower pays $14,877 more tax for transportation than he pays for state and county purposes, or over 3,057 per cent more. His state and county tax amounts to $14 per car.

GROWER NUMBER THREE.

Charges for transportation on 66 cars	$28,246 00
State and county tax	787 00
Excess transportation tax	$27,459 00

This grower pays $27,459 more tax for transportation than he pays for state and county purposes, or over 3,589 per cent more. His state and county tax amounts to about $12 per car.

These are fair illustrations and show how the fruit growers are being taxed and that so heavily that it will not be long, unless relief in some form comes to them, until their orchards and vineyards pass into the control of their creditors.

The question that you are now called to pass upon, which is of more importance to you than all other questions combined that have bearing upon your interests, is, are you going to make an effort to protect yourselves from financial ruin? Should you decide in the affirmative, then the next question will be how? It is quite plain that you can not afford to remain inactive any longer. You can not expect assistance from others, unless you manifest a disposition to help yourselves. Now, what are you going to do?

Now, Mr. Chairman, I am afflicted with a cold and I would like to have the secretary read a portion of the report any way, if no more. This is a copy of what is termed and known in the report as the "Printed Petition." You understand, ladies and gentlemen, that we made a request. We had to back that request up in some way in order to be justified in making it, and therefore we presented it to these eighty-seven different railroad officials, facts and figures regarding the cost of production and setting forth the reasons why the deciduous fruit interests demanded it. We have here statistics compiled from all the auction districts in the United States, showing the result of the sale of 1,046 cars. It shows heavy loss to the growers. These sales were made in 1908. In this you will also find what I stated in the preliminary remarks, that we are backed by all the shipping interests. Here are communications from the Earl Fruit Company, the Producers' Fruit Company, the California Fruit Exchange. Also, we have a letter from Mr. F. B. McKevitt, manager of the California Fruit Distributors, in the matter that we submitted to the railroads for consideration, representing all the other shipping interests in that organization. This is the report which I would like to have read, or such part of it as will give you an idea of the work done by our committee. And while I think of it, I wish to call your attention to the fact that the date in this report regarding the statement of the printed petition is wrong, and if you will be so kind as to change that date on all the copies you get and make it read "January 30, 1909," instead of "January 30, 1908," because we filed this petition of the growers and shippers combined with the railroads on the 30th day of January, 1909, and in putting it into type they made a mistake. There is another thing I wish to call your attention to. In the index you see among the subjects referred to, "Dealing with Facts, not Theories." It is given here as page 26; it should be 27.

This is a very elaborate report and I wish to call your attention to a statement made in the report of the cost to the grower. These have all been presented to the railroads and we have challenged investigation. We requested that we be permitted to have a conference with the railroad officials, that we might be given an opportunity to discuss the pros and cons. We have not been able to get anything out of the railroads in the way of an expression since the filing of our petition, with the exception of two letters which we will now proceed to read.

SACRAMENTO, Cal., February 13, 1909.

Mr. H. A. Jones, Frt. Traffic Mgr. S. P. Co., San Francisco, Cal.

DEAR SIR: Your letter of the 6th inst., in reply to ours of the 4th, which was accompanied by petition from deciduous fruit growers and shippers north of the Tehachapi, received.

In this reply you say: "I assure you that I will be pleased to hear from you at any time on the subject that interests the growers and want you to understand that we are inclined to do anything reasonable to further your interests so far as we can consistently do so."

You also say: "It goes without saying that our interests are mutual and that this company will not place any impediment in the way of developing and increasing the deciduous fruit business, but you must not forget that we are not free agents in establishing rates over territory beyond our own lines."

We are pleased with these statements, for we believe they were made in all sincerity. These assurances give us faith that we will get the reduction in the freight rate asked for in our petition.

We also believe that when we give you additional facts, facts that can not be successfully disputed from any standpoint, you will realize the absolute necessity of your coöperation with the growers and shippers, in every way possible, in their efforts to broaden the area of distribution, and thus increase consumption to a degree that will keep pace with the rapidly increasing production.

We wholly agree with you when you say: "It goes without saying that our interests are mutual," and we wish to impress upon your mind and upon the minds of all other railroad officials that have any interests in deciduous fruit shipments from California that anything we say in advocacy of the granting of the prayer of our petition is said in the true spirit of friendly feeling, void of any prejudices of any nature or kind whatever.

You say, in substance, that the greater portion of the orange shipments are made without refrigeration, which, when reduced to its lowest denominator, means that the railroads lose the profits made on shipments under refrigeration. In other words, shipments made without refrigeration do not bring so much profit to the roads as do the shipments under refrigeration.

Therefore, it follows that the railroads receive more profit from deciduous shipments than they do from orange shipments made without refrigeration.

Again, you carry orange shipments from south of Tehachapi to New York over your road, which is practically one sixth longer haul than is the deciduous haul, at a freight rate that costs the growers $72 less per car than it costs the deciduous growers per car for shipments made from the Sacramento Valley to the same destination.

In order to show how heavily handicapped the deciduous growers are, to the $72 above mentioned must be added $97.50 for refrigeration on their shipments to New York from all stations outside of Sacramento City and Placer County, in the Sacramento Valley.

This makes a total additional cost to the deciduous growers of $169.50 per car, which is practically 50 per cent higher rate than it costs for orange shipments.

If the same rate per mile were charged the orange growers south of the Tehachapi to Chicago, which is practically a 20 per cent longer haul, it would cost the orange growers about $55 per car more for freight, to which add $85 per car refrigeration charges on deciduous shipments from all points outside Sacramento City and Placer

County, in the Sacramento Valley. This makes it $140 more per car than it costs the orange growers, or something over 50 per cent additional cost per car on deciduous shipments.

You are requested to give careful consideration to the following items of cost per car for deciduous fruit shipments, including freight and refrigeration charges, from all stations on the Sacramento and Placerville railroad to New York.

(Same rates prevail from all points in the Sacramento Valley except on shipments made from the City of Sacramento and Placer County. The number of cars loaded at Sacramento is small when compared with the cars that bear the heavier rate for refrigeration.)

Freight		$348 00
Refrigeration		97 50
Railroad charges		$445 50
Loading	$18 50	
Average cost of delivery at car	18 50	
Cost of crates, complete	124 63	
Cost picking, packing and hauling to packing house	158 52	
Cost of production	144 72	
		464 87
		$910 37
Commission on $910.37 at 7 per cent		63 75
Commission on commission $63.75		4 46
		$978 58

The items of the cost of picking, packing, etc., and the cost of production are taken from the writer's own expense account of such cost and are absolutely correct and are subject to your inspection and investigation. These charges do not include the family cost of living, nor interest upon the capital invested, which every organized business interest, including railroad companies, claim to be a legitimate charge, and railroad companies arrange their passenger and freight rates so they will at least bring them sufficient revenue with which to pay all expenses and interest at a rate that will give then a reasonable profit upon their capital invested.

As stated, the cost for support of the family and the payment of a reasonable per cent of profit on the capital invested are not included in the cost above given of growing and marketing a car load of deciduous fruit.

The boom literature that has been sent broadcast all over the civilized world by California promotion committees, chambers of commerce, syndicates and associations formed for colonization purposes, claiming that five and ten-acre tracts, when planted to orchard and vineyard, will bring to their possessors an income sufficient to comfortably support a family and leave something to lay aside for a rainy day and old age, has resulted in inducing many to come to California and to go into the deciduous fruit growing business upon both small and large scales.

It is a small family that has less than three members, and if less, then one that is not much good for the upbuilding of the State, and particularly not much good to bring in revenue to railroads. In order to illustrate the point, we will assume that there are only three members of the family, and that it will take one dollar each per day, or $1,095 per annum to support them, an allowance we believe you will not think an extravagant one, and such as we do not believe you would be willing, under existing circumstances, to assume the responsibility of carrying out—out of which the cost of feeding, clothing, educating, paying doctor's bills, railroad fares, and other necessary expenditures must come.

In considering this matter we will eliminate the five-acre tract altogether, for the reason that the sense in which the proposition makes it, under present conditions, too absurd to be given a moment's consideration, and take up the ten-acre proposition.

Ten acres will yield, approximately, three car loads of shipping fruit. Divide $1,095 by three and we have $365, which must be added to the $978.56, as shown above to be the cost of growing and marketing in the East a car load of deciduous fruit, exclusive of the cost of family support, and we have $1,343.56, to which we must add the full commission on the $365, which is $27.29, and we find the average cost of growing and marketing a car load of California deciduous fruit in New York to be, without allowing interest on the capital invested, $1,370.85.

Good orchard and vineyard land, planted to trees and vines, has commanded all the way from $300 to $1,000 per acre, and a large area has been sold at these prices.

Take the minimum price on ten acres, and the initial cost is $3,000. The interest at 8 per cent per annum on $3,000 is $240. This sum, together with the additional commission, added to the $1,370.85 above mentioned, makes $1,628.86.

We will not consider the $1,000 acre land. To do so would add $560, together with additional commission, which would make it necessary for a car load to sell for $2,229.81 in order to pay 8 per cent interest on the initial cost or capital invested.

No doubt when you first go over the statements and figures above given you will entertain doubts as to their correctness; should such be the case, we most respectfully solicit that you make a thorough and critical investigation for the purpose of showing us wherein we have erred. We believe if you will do this you will find that, in a general sense, our statements are correct.

Of course, in some cases the cost of growing and marketing a car load may be less, but where there is one such case, there are likely to be two that will cost more.

Last season, from which our expense figures were compiled, was probably the most favorable for doing such work at a minimum cost that we ever had. Seasons in which we have rain early in September, and two or three more rains before the close of the season, the cost of putting up a pack is much more expensive than is shown to be by the figures given.

In such seasons in the past the same work has cost $291 per car, or $133 more than our figures show. This is a statement of cold, unexaggerated facts, and of a nature to demand your most serious consideration.

Money paid out for permanent improvements is not included in the figures above given.

We believe that if your company will present to its connecting lines, in a manner its power and influence will permit it to do, it will have but little trouble in convincing them that the request of the deciduous growers and shippers is a just one.

We have the utmost confidence in the ability of your company and its management to bring about an adjustment of rates that will give a fair and just distribution between all interests in common of the profits made on deciduous fruit shipments from the Sacramento and San Joaquin valleys.

Hoping for the best, we are

Respectfully yours,

R. D. Stephens, Chairman,
M. E. Angier,
C. M. Hartley,
Fruit Growers' Committee.

Sacramento, Cal., November 9, 1909.

Mr. H. A. Jones, Freight Traffic Mgr. S. P. Co., San Francisco, Cal.

Dear Sir: We submit to you and ask that you give careful consideration to the following statement, which is made up from the California Fruit Distributors' reports of the sale of California deciduous fruit—mostly table grapes—in the following markets.

This statement includes the gross sale of all cars reported by the distributors and should be accepted as authentic and correct. The sales were made in the following markets:

New York, Chicago, Boston, Philadelphia, Pittsburg, Minneapolis, Indianapolis, Baltimore, St. Paul, St. Louis, Cincinnati, Cleveland, and Buffalo.

September 23d	40 cars	grossed $32,489,	averaged $812 00
September 24th	43 cars	grossed 32,283,	averaged 774 00
September 27th	76 cars	grossed 62,536,	averaged 849 00
September 28th	34 cars	grossed 29,382,	averaged 864 00
September 29th	58 cars	grossed 48,050,	averaged 824 00
September 30th	35 cars	grossed 28,229,	averaged 806 00
October 1st	31 cars	grossed 27,064,	averaged 873 00
October 4th	62 cars	grossed 55,142,	averaged 889 00
	379	$315,175	$831 59

Total cars, 379; average loss per car to grower, $168.41........ $63,827 00

Revenue to railroads from 379 cars........ $163,000 00

During the time the 379 cars above mentioned were shipped there were 713 other cars shipped, making a total of 1,092 cars in eight days.

It is reasonable to assume that the ratio of profit and loss made on the shipment and sale of the 379 cars above given would give a very close estimate of the result of the shipment and sale of the 713 other cars and when applied will show the following results:

Revenue to railroads:
1,092 cars—26,208,000 lbs........ $469,000 00
Loss to growers:
1,092 cars—average loss per car to growers, $168.41........ $183,000 00

In other words, $183,000 of the growers' principal, the capital they have invested, to produce the 1,092 cars of fruit, was absorbed in making up the $469,000 income to the railroads, and all in eight days.

The demand for labor during the busy season was far greater than the supply, with the result that wages were materially advanced and ranged from $1.70 to $2.25 per day. This increases the cost of picking, packing, etc.

Cost per car to the grower at the $1.45 rate:

Freight and refrigeration	$445 50
Crates complete	110 00
Picking, packing, etc.	231 00
Loading	18 50
Delivery at car	18 50
Interest upon capital invested	90 00
Taxes (minimum)	10 00
	$923 50
Commission	64 64
	$988 14

To the $988 must be added the cost of production, which, when properly done, includes the following items:

Pruning, clearing away brush, twine and tying (when staked), plowing twice, cultivating from four to six times, hoeing, sulphur and applying same twice, irrigating, etc., which, when done in the most economical way, will make the total cost to the grower per car considerably more than $1,000, which does not include family support.

Of the 1,092 cars above given, only 39 of them sold at and above cost, thus showing that eighty-nine and seven-tenths per cent sold at a loss to the growers.

We repeat that no unreasonable, selfish or unjust motive actuates the growers in this matter, but, on the contrary, they are moved by a desire to promote all interests involved.

Many growers—as shown herein, 89 per cent of them—realize that they are facing financial ruin unless relief in some form comes to their interests, which will be impossible, except through a radical change in the present methods and cost of transportation.

The results from shipments and sales of California deciduous fruit this season show that if the request of the deciduous growers to have their shipments placed upon an equality with the orange growers be granted, the question will then be: Will the relief coming therefrom be sufficient to place the rapidly increasing shipments upon a fairly just paying basis?

Any action on the part of the railroads that in any manner will tend to increase the cost to the growers to market their products will certainly bring ruin to a very large per cent of the growers, such as is shown to be the case in the eight days' shipments and rates above given, when more than 89 cars out of every 100 brought a heavy loss to the growers.

The increase to date in deciduous fruit shipments over those made in 1907 is 7,148 cars, or practically 100 per cent.

The increase in table-grape shipments to date over the shipments of 1908 is 1,747 cars, or over 47 per cent.

In conclusion we will repeat what we said in our petition under date of January 30, 1909:

"We call your attention to the indisputable fact, which is, that to broaden the Eastern markets sufficiently to consume at a profit to the growers the great increase in the tonnage of table grapes and deciduous tree fruit shipments from California is utterly beyond the power of the growers, and if this question is to be successfully solved it must be through the ability, allied with an earnest and determined effort on the part of the transportation companies that handle such shipments."

Respectfully submitted.

R. D. Stephens, Chairman,
M. E. Angier,
C. M. Hartley,
Fruit Growers' Committee.

MR. STEPHENS. Now, that was a general average. These were not selected cars, but every car that was reported, some of which brought good, remunerative prices. For instance, the sale of September 28th; there is one car brought $1,271.00, one $1,045.00, and 32 cars average loss to grower, $145.19, made the loss to the grower $4,934.00; two cars brought a profit of $216.00, which is to be taken from the loss, which leaves a net loss of $4,618.00 that those cars sold upon that day. Here are several $1,200.00 cars, $1,100.00 cars; here is a $1,300.00 car on

October 1st; one car brought $1,233.00; two cars $1,144.00; three cars $1,058, and 24 cars average loss to grower $206.38, making a total loss of $3,936.00. The whole list is gone through in that manner.

I wish to state in addition that the Sacramento Valley Development Association, those men referred to as legitimate actors that is, honorable in their actions to build up the Sacramento Valley- gave an unqualified endorsement to our committee, in as strong terms as an endorsement can be made, because they saw and they see now that some relief in some manner must come to this, the greatest of all interests in the State of California, to the producers, or else you can not build up this State, and particularly the Sacramento and San Joaquin valleys, upon a permanent and solid basis. Now, Mr. Chairman, if you will read the committee's letter addressed to Mr. McKevitt and Mr Walker, you will see how they stand.

SACRAMENTO, November 20, 1909.

Mr. F. B. McKevitt, Gen. Mgr. California Fruit Distributors, Sacramento, Cal.

DEAR SIR: Realizing that in the position you occupy, that of General Manager of the California Fruit Distributors, you have opportunities of gathering information as to the actual results that came from the sales in the Eastern markets of our deciduous fruit shipments during the present season, we, the undersigned members of the Fruit Growers' Committee on Freight Rates, appointed by the fruit growers of the State at their last State Convention, 1908, respectfully submit the following questions, and ask that you give to them your careful consideration, and if after so doing, in your judgment, they have sufficient merit and bearing upon the future development and prosperity of California's greatest and most valuable of all its many resources, viz., its horticultural interests, you will give us the benefit of your knowledge as to the facts involved in the questions, you will greatly oblige the members of our committee.

If we are wrong in any of our contentions, do not hesitate to say so. All we want is the truth. In answering the questions should you see proper to do so, we wish you to take into consideration the fact that there has been 15,006 car loads of deciduous fruit shipped to date this season, against 7,416 in 1907, or, an increase of over 100 per cent in two years.

In 1906 there were 2,050 cars of table grapes shipped against 5,751 cars to date this season, or, an increase of over 180 per cent in three years, with the probabilities of a proportionate increase for several years to come, providing the interest can be placed on a paying basis from a grower's standpoint; otherwise a large percentage of the present acreage must be uprooted.

Do you believe that the request of the deciduous fruit growers of the State, and more particularly those of the Sacramento and San Joaquin valleys, which was made and presented to our initial railroads on the 30th day of January last, to have their shipments to Eastern markets given the same transportation rates as were then being given to the orange growers from south of the Tehachapi on their shipments to the same destination, to be just and equitable to all legitimate interests involved?

Do you believe from the experience and the results obtained from the sales of our fruit in Eastern markets, taking into consideration the great increase made in shipments that the relief prayed for by the deciduous growers would, if granted, be sufficient in itself to place the deciduous fruit industry as a whole upon a sound, dependable and reasonable paying basis?

Has the demand for our fruit in the East kept pace with the rapidly increasing supply?

Has there been an increase in wages for orchard and vineyard labor, and is there a sufficient supply of a class to properly and economically handle our crops?

Is it true that a large per cent of the table grape crop is left on the vines for the reason that it would entail a loss to pick, pack and ship to market without taking into consideration the cost of production, taxes and interest on the capital invested?

From your experience as a grower what has been the cost, since the rain, to properly pick and pack a crate of Tokays?

Respectfully yours,

R. D. STEPHENS, Chairman,
M. E. ANGIER,
C. M. HARTLEY,
Fruit Growers' Committee.

OFFICE
CALIFORNIA FRUIT DISTRIBUTORS
1012 Second Street.

SACRAMENTO, CAL., November 22, 1909.

Messrs. R. D. Stephens, E. M. Angier, C. M. Hartley, Fruit Growers' Committee.

GENTLEMEN: I am in receipt of a communication from you under date of the 20th, in which you ask me as Manager of the California Fruit Distributors, which organization handles about 80 per cent of the deciduous fruit shipments of the State, to answer certain questions in regard to actual results obtained from fruit shipments to Eastern markets during the present season, and other questions relating to the general condition of the business.

In the first place you refer to the large increase in the shipment of table grapes during the present season over those of any preceding year, amounting to over 180 per cent in three years, with the probability that there will be a proportionate increase for several years to come, providing the business may be placed on a paying basis from the growers' standpoint, and that if it can not a large percentage of the present acreage must be uprooted.

It is a fact that grape shipments have increased very materially of late, this present season showing an increase over last year of nearly 2,000 car loads. If the information I have received is correct, this proportionate increase will be kept up for a number of years, until shipments reach such large figures that I do not believe it will be possible to market them profitably. Acting on this belief I have advised growers who have consulted me on the subject to begin the removal of vines preparatory to growing other crops, and this advice I am following myself in our vineyards at Vacaville.

Unless we are able to give this fruit a far greater distribution than ever has been possible in the past I can not see how it will be possible to profitably market the thousands of car loads that will soon be available. There is but one way in which this could be accomplished, and that would be through very low cost of transportation as well as low cost of labor in California, both of which conditions I see no reason to expect in the near future.

You ask if I believe it would be just and equitable to all legitimate interests if the request of the deciduous fruit growers be granted by the railway lines, which request was that their shipments should receive the same rate for transportation as were given to the orange growers of California.

In answer to this question I would say that there should be no question as to the justice of giving as low a rate on deciduous fruit as on citrus fruit. There is no reason why there should be any question about it.

There is, however, one feature in connection with your request to which I would like to call your attention, and that is, that you do not go far enough. While it would help us materially to have the so-called postage stamp rate of $1.15 per hundred apply on our shipments, it will not give the relief required, it will only help.

I do not believe it will be possible for the deciduous fruits of California to pay a greater rate than one dollar per hundred, and am firmly of belief that in the near future the railway officials will recognize this fact, and will be obliged in self-defense to give us such a rate.

A very large percentage of the deciduous fruit shipments from California during the seasons of 1908 and 1909 will show absolutely no profit to the grower, and it will not be possible for this condition of affairs to continue for any great length of time without producing the greatest hardship and loss to all those engaged in the industry. If no relief can be found it will mean that many of our orchards and vineyards must be abandoned.

You ask if the demand for our fruit in the East has kept pace with the rapidly increasing supply, and I regret to be obliged to say that in my opinion it has not. In order to show a reasonable profit to the California grower it is necessary to sell fruit in Eastern markets at a price that puts it out of the reach of the working classes.

Until we are able to sell our fruit profitably to ourselves at a sufficiently low price to enable this great army of people to purchase our products we can hardly hope to increase the demand very materially.

In answer to your question regarding the increase in wages for labor, and asking if there is a sufficient supply of a good class of labor to properly and economically handle our crops, would say that it is a matter of general knowledge that wages are advancing steadily every year, and that there is not sufficient supply of good labor to handle our crops.

Not only is the price of labor increasing, but the number of hours constituting a day's labor are decreasing, and with higher wages and shortened hours there is a material lessening of the output per man. It is not so many years ago that we figured on a cost of 10 cents per package as covering the labor of picking and packing a crate or box of fruit; it has been necessary of late to modify these figures so that now 15 cents is a low cost for this work, and in many instances it will average

20 cents throughout the season. Since the middle of October I believe it is a fair statement that the labor of picking, cleaning and packing grapes has in most districts been in the neighborhood of 30 cents per crate. This high cost can of course be attributed to the fact that the grapes were affected by early rains which made it necessary to pick and clean them with extra care.

You ask if it is true that a large percentage of the table grape crop was left on the vines this year for the reason that there was no profit to be derived in shipping them.

Unfortunately it is true that such is the case. I am informed that in many vineyards in the Lodi and American River districts a very large percentage of the crop is still remaining on the vines, and I know that this is the case in the Vacaville district in our late vineyards.

I have been told that in all probability there were in the neighborhood of 1,000 car loads of grapes left unpicked because there was no prospective profit in shipping them. I do not know whether this is true or not, but I believe there are several hundred car loads of these grapes which will be allowed to rot on the vines.

Your last question is what has been the cost of properly picking and packing a crate of Tokay grapes since the rain.

I can only answer this question from my own experience, which has been at Vacaville. I found some three weeks ago that it was costing 25 cents per crate to pick and pack the Tokays, and as I did not believe there was any margin for profit in the fruit with this high cost for labor, I ordered picking to cease and it is estimated that we have something like 200 tons of grapes remaining on the vines in the 50-acre vineyard of which I am speaking.

A particularly unfortunate thing about these early rains which damaged our grapes this year is that they did not come early enough and hard enough so that all shipments would have entirely ceased, as so far as we are personally concerned it would have been money in our pocket had we not shipped a single crate of grapes since the first of October.

Trusting that I have fully answered your questions and regretting that I can not give a more encouraging report, I remain,

Yours very truly,

CALIFORNIA FRUIT DISTRIBUTORS,
F. B. McKevitt, Manager.

General Manager W. C. Walker, of the California Fruit Exchange, was asked identically the same questions and the following is his reply:

OFFICE
CALIFORNIA FRUIT EXCHANGE.

SACRAMENTO, CAL., November 23, 1909.

Mr. R. D. Stephens (Chairman), Mr. E. M. Angier, Mr. C. M. Hartley, Fruit Growers' Committee.

GENTLEMEN: Your valued favor of the 20th instant at hand. In reply would say we have read over your various communications and can not see wherein your contentions have been in error—in fact, we have been agreeably surprised at the correctness of your figures and the elaborate detail covering the same.

In regard to your question, as to whether we believe the request to have our shipments given the same transportation rates as those of the orange growers, would say we think this request is very mild in comparison to the existing conditions in the deciduous fruit business as a whole. I think that a demand for a rate of $1.00 per hundred would be more in line with our requirements than any other rate, and I believe that in trying to present our position we should leave other industries out of the question, because the situation has changed so tremendously in the past two years that a comparison of the prices realized for citrus and deciduous fruits is so far apart that to even try to put us on the same basis as the citrus fruit growers would be unjust and would not help us to the extent required.

This season has been one of the worst in the history of the business and from the enormous plantings which took place during the last few years the future is even darker than the present. We know that for certain, in some districts, they are contemplating pulling up every third vine, as the growers who have taken time to compute the facts realize that even a reduction to $1.00 per hundred is not going to save the industry—especially table grapes.

As far as we can see, from a strictly cold-blooded business standpoint, it is better for the railroads to pay heed to your requests and warnings now before it is too late. It is almost a certainty that unless the railroads announce that they intend to make a reduction for next year's business, that some uprooting is surely going to take place; whereas, if their intention to reduce the rate is made known this drastic action will be deferred.

In reply to your inquiry as to whether the demand for our fruit in the East has kept pace with the rapidly increasing supply, we can safely answer "No." There are a few varieties that have been fortunate in the past two years, but there is no telling when even a large crop of those varieties may oversupply the present market.

In answering this question we wish to lay emphasis upon the fact that the firms engaged in the marketing of fruits have not been idle in the matter of developing markets. I know, as far as this exchange is concerned, we placed fruit in over eighty markets last year as against twenty-six in the previous season; and this year the number of markets gone into will far exceed last season; in fact, we have been selling car loads of fruit in markets we never dreamed of three years ago.

The distribution of deciduous fruits to-day is on a very broad scale, especially west of Chicago, so that the fault can not be charged up to the lack of energy in finding new markets; but the supply has been so tremendous in the past two years, and the rates so high east of Chicago, that we are confronted with two problems that are insurmountable; and as the supply is something that can not be reduced unless almost Spartan measures are adopted we are forced to consider ways and means to overcome the hill that we are confronted with, and the first means to help us will be the reduction of the rates east of Chicago, and give us an opportunity to exploit that very large field.

The way the matter stands now our lowest rates are west of the considered center of population. The present center of population is considered about the southeast portion of Indiana. Therefore, if our rates were put on a reasonable basis so that we could reach the mass of the people with our products at a price that will encourage them to buy we can increase the distribution of our fruit very materially; but if we are going to be kept away from the center of population by a burdensome rate the situation is going to continue to grow worse, and where it will end is a grave question.

In regard to your inquiry as to whether there has been an increase in wages for orchard and vineyard labor, would say that I do not believe there is any one acquainted with the conditions but would answer unqualifiedly "Yes." And as to whether there is a sufficient supply to handle the crops we answer "No." As far as we can see, it was a very fortunate thing this year that there was not sufficient labor to handle the crop in time, especially grapes. If there was, the results would have been disastrous for at least three quarters of the entire grape crop.

In regard to your inquiry as to whether a large percentage of the grape crop was left on the vines, as it would entail a loss to ship the same, would say that your statement is quite true. Very frequently we were called on the 'phone by outlying points and asked whether it was worth while to pick the fruit from the vines, and on many occasions we suggested that the fruit be left where it was because we could not honestly counsel them to harvest the fruit. Many and many times we were reluctant to make this statement because we are a growers' organization, trying to seek a market for the products of our members, and we were placed in a very unenviable position to tell a man there was no place for his product, after he had spent the year in plowing, pruning, sulphuring, etc., in order to get his products ready for market and then to know that his livelihood was being snuffed out because there was no place to ship his product with any certainty of receiving back enuogh to cover the expenses of transportation, packing, and picking.

The result was there must have been considerable over a thousand cars of grapes left unharvested, not by reason of their condition, but by reason of the situation in the markets.

This condition is something very sad to behold, because we know from seeing the accounts from day to day what it means for a man to pick 100 crates of grapes, spend hours carefully cleaning the bunches, getting everything so it looks attractive for the market, haul the fruit to the car, ship the same to the East, and when the accounts come back ask the grower to dig up for the privilege of sending his fruit forward.

This is no jesting matter. We are dealing right now with the question of the homes and futures of a great many people in this commonwealth, and it is surely up to the railroad authorities to take some action and do it quickly, or they will rue their procrastination. Not alone were the Tokays affected, but the Emperors were more or less affected in this way:

The market, as a general thing, for Emperors, is not very active until the Tokays have been pretty much disposed of. This year the Tokay crop held on so long by reason of the big supply and low market that a great number of Emperors were left unpicked and the frost ruined them. We know of one case where a grower had between four and five thousand crates of Emperors ready for picking and the entire crop was lost, and he returned his shook and did not send a solitary crate forward.

We are dealing now with facts, not theories, and we sincerely hope that your committee will be able to so bring the matter home to the transportation companies that they will be ready to give you the relief asked for, as surely the amount prayed is small enough.

In regard to your last question, would say that we have found from experience that the average cost of properly picking and packing a crate of Tokays since the rain has been approximately 32 cents to 37 cents, depending somewhat on the locality—some even claim that the cost is higher than that, but we consider the amounts given above about the general run this year in the heavy producing districts.

Concluding, we wish your committee all success in your undertaking, and we have no doubt from the able manner in which the question is being presented that something should be done, if the powers that be have any respect at all for the persons who are furnishing them the tonnage from which they are earning their transportation charges.

Respectfully yours,

W. C. WALKER, General Manager.

MR. STEPHENS. I wish to state that we state in conclusion that we realize that the only power existing that could give the relief was the railroad companies, and we relied on their honesty and integrity and ability to do so. The object in publishing these two communications from other railroads is a fair sample of about forty others we received, showing that the whole responsibility rests upon the initial lines of adjusting these rates which will be satisfactory to the growers and will permit them to make a reasonable profit.

Now, there is one peculiar thing about this. I don't know. The railroad companies may have a representative here, they may have somebody here that will assume to deny the correctness of the statements contained in this report. We would be very glad to have such the case. If we are wrong, we want to be shown where we are wrong, and we have tried to get a meeting with the railroad company, but have not been able to do so. In other words, they have closed up like a clam and have not said a word in the last six months except to acknowledge communications. They have not denied it, and therefore this must stand as positively correct, and why they have not some official here to officially represent them I can not understand. If their action is right, it ought to be easy for the railroads to show that. I would be pleased to have any railroad official, any other man representing them, come and attack the statements made in this report.

Well, gentlemen, here are the reports. I hope you will take them home and read them, because there is much more in them than has been read here, and upon giving the contents careful consideration you will see that our committee has proceeded in the most quiet manner. We have said to the railroad companies that we were not making a newspaper fight, that we were not appealing to the public for sympathy and support, that we were depending upon their judgment to right a wrong, to act in a manner that would permit the deciduous fruit grower to make a reasonable profit on the capital he has invested. We did not wish to come out in public one year ago and state the facts, the true conditions existing, because we believed that we would consummate our purpose in that quiet manner. We did not believe that the railroad officials understood the real situation, and we therefore had faith that upon the presentation of the facts in the case to the railroad officials they would accede to our demands and would grant them.

As Mr. McKevitt says, as Mr. Walker says, right now if they would grant this $1.15 rate which they have been giving for years to the citrus shippers, it would not be sufficient alone to bring a profit to many deciduous growers. We have asked for nothing but what they have been giving. We explain to them, in other portions of our letters, that we are not even asking for the rate which they had been giving for years to the lemon interests, of one dollar, and the rate which they have been giving to you, gentlemen, here of one dollar. We ask for the same rate given to the orange shipments alone, and inasmuch as they have been giving those rates to those interests, is there any reason tenable why they should not extend the same rates and facilities to the deciduous fruit growers? I thank you, gentlemen. (Applause.)

MR. BILLS. Mr. Chairman, I move that the Chair appoint a committee of three to take up the matter of finance and help out paying for this report.

The motion was duly seconded and carried.

PRESIDENT JEFFREY. I will appoint Senator C. B. Bills, Mr. B. F. Walton, and Mr. J. P. Dargitz a committee of three to look after Senator Bills' motion.

The convention adjourned until December 9, 1909, at 9.30 A. M., but in the mean time the delegates, on the evening of December 8th, attended in a body a reception tendered them by the ladies of Watsonville.

THIRD DAY.

WATSONVILLE, Cal., December 9, 1909.

The convention was called to order at 9.30 A. M. by President Jeffrey.

PRESIDENT JEFFREY. Now, Mr. W. H. Volck, one of your honored citizens, will present "Insect Pests and Diseases of the Apple." (Applause.)

MR. VOLCK. With regard to this subject of "Insect Pests and Diseases of the Apple," it is a very broad one, and a paper to be presented and read before this convention must necessarily be of limited length; so, in order to make the matter in this paper more clear and perhaps take it up more thoroughly for those who are most interested, I have distributed around in the book racks of these seats two bulletins. You will find one in the other, and the outer bulletin, called "Winter Control of Orchard Pests," is just from the press, and this edition of 500 copies was made for the benefit of the State Fruit Growers' Convention, and we hope that it will take all of these bulletins. There may not be enough people in the audience to take them all individually, but you may have friends that you can distribute them to, and we would like to see that these bulletins go out, because they show in a concise manner all the work that has been done here, and they will make the matter in the paper more clear. These bulletins, I may add, are published at the expense of Santa Cruz and Monterey counties, which have heretofore supported this investigation, and in sending out a county publication broadcast over the State we feel that we are not advertising Santa Cruz and Monterey counties as a land of pests, particularly, but as a place where they know something about how to get the better of such troubles.

INSECT PESTS AND DISEASES OF THE APPLE.

By W. H. VOLCK of Watsonville.

The subject of insect pests and diseases of the apple is rather a broad one, and perhaps the best method of approach is to take a hypothetical orchard and carry it through the year. The necessities of this orchard in the way of treatment for diseases will vary with the locality, but there are certain general methods of procedure applying to all. Also, in California the great bulk of the apples are produced in the central and northern coast counties, well within the limits of the ocean influence. The Pajaro Valley is the center of this production, and in point of quantity California apples may be considered as the special crop of this locality.

Other districts produce apples, but as yet to a quite limited extent. The mountain sections have been developed slightly, and produce a type of fruit quite distinct from the coast. In the higher altitudes, free from fog, the growth of the trees is also different, and there is less trouble with fungus diseases. These mountain districts may some day become quite important, as there appears to be an abundance of suitable land comprised in them. But, for the purposes of this discussion, it is best to locate the orchard, which is to be a model from the sanitary standpoint, in what is at present the center of the industry.

The climate of the Pajaro Valley and other similar localities is well adapted to the growth of apples, but not equally to all varieties. Aside from soil, climate may be considered the principal factor entering into the production of a crop. When plants are growing under climatic conditions favorable to their best development the inroads of diseases are reduced to a minimum because of the natural vigor so induced.

The cultivated varieties of the apple differ materially among themselves and from the wild species from which they were derived.

These differences in the varieties affect their tolerance of climatic conditions very materially so that a variety doing well under one set of conditions may fail in another locality. Then the selection of varieties suitable to the locality is the first step to take in the protection of the orchard from the inroads of pests.

In choosing varieties the commercial value has to be taken into account, for it would be useless to plant an orchard to thrifty growers which do not yield regular crops of salable fruit. The planting must then be made with those commercial varieties best adapted to the locality, and it is often preferable to select a lower-priced apple which will yield abundantly than a more fancy type producing poorly.

Of course, it is understood that the land must be suitable for the apple tree, neither too wet nor too dry, deep and moderately fertile. Fertility and moisture can be regulated by artificial means, but the depth must remain largely as nature provided it. Sometimes a lack of one of these requirements may be compensated for by supplying more of another; to illustrate, shallow soils may be made to grow good trees if fertilized and irrigated.

To name a list of apple varieties which will do well enough in a specified locality to make successful pest control possible is not a difficult task if all the conditions are known. Important variations in conditions, may, however, be found within a half-mile as regards the climate, and a few rods for soil and drainage. Such differences within a short distance renders general recommendations of little practical value.

In selecting the site for an apple orchard the soil should be surveyed to determine its adaptability to the growth of trees, and if there is any question about an abundance of water the practicability of irrigation should be considered. The climatic conditions are not so easily determined, as a long period of observation is necessary. By observing the growth of such trees as may be in the vicinity much important information concerning soil and climate may be quickly gained.

That pests are potentially present in the orchard before it is planted may be a new idea to some, but a heavy clay or adobe soil means woolly aphis on the roots, while light clay to sandy loams give comparative immunity. Cold winds and fogs bring about leaf spot diseases and favor the powdery mildew. On the other hand, warm sheltered localities are subject to the codling moth and scale insects.

Of the late summer and winter varieties of apples grown in the coast districts the Newtown Pippin is perhaps the most exacting in its requirements. Cold winds and fogs stunt it badly and bring about leaf spot diseases. Fogs at more moderate temperatures induce serious infections with the powdery mildew, which also stunts the growth. On the other hand, it is a sure bearer and resists drouth comparatively well. On good soils, in a well sheltered locality, this variety makes a sturdy growth rather resistant to diseases, but is quite subject to the codling moth and apple scab.

The Yellow Bellflower, White Winter Pearmain, and Red Pearmain can be pushed much further into the zone of cold winds and fogs than the Newtown, but the bellflower may not bear well under these conditions. The Missouri Pippin and Langford should also be mentioned among those varieties which will endure a wide range of soil and climatic conditions. The bellflower requires a rich, well watered soil and may fail in localities where Langfords, Red Pearmains, Missouri Pippins, and Newtowns do well.

The varieties of early summer apples are less numerous, and Skinner's Pippin is probably the most adaptable, with the Red June a close second. Both of these varieties are relatively immune to diseases. The Gravenstein is subject to the powdery mildew and so should grow in sheltered localities.

All this information regarding the adaptability of varieties is the result of experience, and unfortunately a large acreage was planted before these facts were known. A good many of these orchards happen to be in localities where all varieties do comparatively well, but others show decided unadaptability for certain types. The Newtown has been badly misplaced, and is frequently seen to be so stunted as to be worthless. In such orchards the best practice would be to remove the hopeless trees and replant with varieties that will do well.

With such attention to preliminary details the orchardist is in a position to successfully combat pest, both because the insect and fungus parasites will not be so destructive and the trees will have the ability to withstand the injurious effects which may follow the application of certain sprays.

We are frequently requested to recommend some application which will bring the trees out better, but unless the natural conditions required to make a good tree are fulfilled this is impossible. On the other hand, where such lack of vigor occurs in orchards that naturally should be doing well, our present knowledge of remedial measures is usually sufficient to make practical recommendations possible.

The insect pests and diseases of the apple have been shown to vary in kind and character according to climatic and soil conditions, but there is apparently no combination of varieties and locality which will insure complete immunity. There are numerous insects and related organisms which make use of the apple as a food plant. Perhaps all of them are capable of inflicting serious damage under the proper conditions. Also, fungus and bacterial diseases, while not so great in variety, may make up for this deficiency by a greater virulence. If the troubles ended here they would be quite sufficient, but another group of diseases may be present. The reference is to those disorders which can not be attributed to a parasite, and are called physiological diseases.

If all of these parasites and diseases were present, in destructive form, the task of the apple grower would be a hopeless one. So, in the hypothetical orchard we will assume, as is always the case, that only a limited number need be considered. The sap-sucking insects most likely to be present are the San Jose scale, greedy scale, and woolly aphis. The leaf feeders and other chewing insects will include the codling moth, tussock (horned) caterpillar, cankerworms, and the tent caterpillars. Of the fungus diseases, the apple powdery mildew, apple scab, and wood rot or sappy bark disease are most important. A physiological disorder, known as "leaf spot," may also be present.

Even this limited list may have only a few representatives in a given year. In the coast districts those recurring most persistently are the codling moth and apple powdery mildew, with the scales and woolly aphis a close second. The apple scab is more often absent than present, and the caterpillars are subject to very marked fluctuations extending over a period of years.

The insects here considered are divided into two classes, according to the manner in which they take their food, that is sucking and chewing. The scale insects and aphids suck the juices from the inner tissues without eating the surface, while the caterpillars eat the substance of leaves and fruit.

The San Jose scale is an insect which passes the greater part of its life under an armor or scale formed by the secretions of special glands. The youngest stage of the insect resembles a minute louse and crawls about over the tree in search of a suitable spot to locate for the remainder of its life. These young are also carried by the wind, birds and other agencies to distant trees, thus spreading the infestation. Potentially, these young are not very potent under balanced conditions. Not more than one hundred succeed in locating and the number may be much less.

After locating the insects are still subject to death from various causes so the number reaching maturity is still further reduced. When the San Jose scale it probably does not change location, and certainly is unable to do so after a time, for the legs are lost. This scale matures quickly, for as high as ten generations have been recorded in a year. The young are born alive and continuously for a considerable period. In California the winter is passed by both adult and immature insects, the first young appearing in February and March.

The injury caused by the San Jose scale is caused by the injection of a toxic substance into the tissues of the bark, and is proportional to the number of insects present. The scale may be so numerous as to form a continuous crust over twigs, limbs and even the trunk, or there may be only a scattered infestation on the small twigs. In the first case death of limbs and perhaps the whole tree may ensue, but with the lesser infestations the injury may be confined to a few red spots on the fruit, caused by individuals which have located on the apples in May and June. The red stain is quite a constant character, and the inner bark of infested branches is deeply colored. The San Jose scale is not confined to the apple, but attacks several other species of trees and shrubs. It is supposed to be a native of northern China.

A number of other scale insects are closely related to the San Jose scale, and have similar life histories. We have spoken of the greedy scale, this is a larger species than that just described, and has a more substantial armor. On the other hand it is less virulent, seldom becoming numerous enough to form a continuous crust. Also, it is less poisonous to the host, not producing a colored stain or killing the attacked parts. The injury appears to be confined to the stunting of the growth, in the worst cases, and dead leaves may hang over winter on infested trees. Without causing serious injury to the tree this insect may bring about considerable financial loss through its habit of locating on the fruit. The presence of the greedy scale on the fruit causes rejection in some markets.

To successfully combat scale with sprays it is necessary to use some wash which will kill by contact with the surface of the insect's body. Poisons taken internally are not effective because the habits of feeding prevent the imbibing of such substances applied to the surface of the bark as a spray. On the other hand contact with the bodies is rendered difficult because of the armored protection, and strong penetrating washes must be used. Sprays capable of killing scale are too caustic to permit of use on foliage, and so must be applied while the trees are dormant or before many leaves have developed.

A list of scalecides will include the lime-sulphur solution, rosin soap, whale-oil soap, distillate oil, and mixtures of oil emulsions with lye. For general purposes the lime-sulphur solution should be chosen.

To continue with the discussion of insect pests, the plant lice or aphids still remain to be considered in the class which are not controlled by stomach poisons. The aphids feed in the same way as the scales, but differ in some other respects. They are larger, and not protected by a scale or armored covering, but in the case of the woolly aphis a wool-like substance acts in much the same way. The aphids can change position at any time, but if not disturbed may not do so. Propagation is by means of both eggs and living young, and the unrestricted rate of increase is stupendous; but aphids have many enemies including insects and fungus diseases. Weather conditions also have a great influence on them, and the combined effects of all may be so great as to almost exterminate the plant lice.

The woolly aphis is the most persistent species attacking the apple, and, perhaps, the world over, causes as much damage as any of the scales. This aphid infests both the tops and the roots, and under California conditions one form is always present, that is, females which give birth to living young. Contrary to the general impression, the top infestations are practically independent of those occurring on the roots. In soils of light or sandy texture the roots may not be attacked, but frequently abundant development occurs on the tops. Wintering-over above ground is easy, in this mild climate, and small ones are often found under the protection of rough places in the bark. The woolly aphis multiplies rapidly in the spring and soon infests many of the twigs, forming compact colonies, which become conspicuous by the development of the white woolly covering. The same increase occurs on the roots, but the subterranean form usually has its greatest development later in the season. The toxic substances injected into the tissues of the tree produce disturbances in cell growth resulting in the development of galls and warts. On the roots, these galls frequently interrupt sap flow and bring about decay. The tops are also stunted in the same manner. In addition to the poisoning, a large quantity of sap may be removed, so taxing the vitality of the tree, and the excreted honeydew produces a very objectionable gumming of the foliage and fruit.

Contact insecticides must be used for the woolly aphis, but the lime-sulphur solution, so valuable against scales, is not very effective for this insect. The oil emulsions and nicotine washes give better results. Something can be done towards controlling the top form by going over the trunks and large limbs, very thoroughly, during the winter with distillate emulsion. The object is to kill the colonies wintering in the protection of the rough bark formation about wounds. The application has to be very thorough to insure penetration.

This winter treatment may not have killed all the colonies of the woolly aphis, so nicotine applications may have to be made in the summer. The root form of the aphis is not readily reached by any treatment, but the crown can be largely protected by removing some of the earth and pouring in a quantity of tobacco decoction.

Of the chewing insects the codling moth is probably the most important. This species is estimated to cause a 40 per cent loss to the apple crop of the world. The codling moth passes the winter as a mature worm or larva, well concealed and protected by a cocoon, not always on the trees, but frequently in the ground, fences, and old buildings. In the California coast districts these wintering-over larvæ do not pupate and emerge as moths until the middle of May, and then not completely, for numerous moths appear even up to the middle of June. After the appearance of the moths it is not long before eggs are laid, and the young worms hatch some ten days later. The early eggs are deposited on the upper surface of the leaves, and somewhat later the under surface is frequently chosen. Not until the fruit rind has become quite smooth and free from hairs are the young apples selected in preference to the leaves. Eggs are seldom if ever laid in the calyx cavity.

The young larvæ of the codling moth, when hatching upon the leaves, frequently have to crawl considerable distances before reaching an apple, and may feed to some extent on the foliage. The larvæ have been reared to maturity on the foliage alone. Many of these exposed young may perish, and even after entering the fruit, death frequently occurs from diseases and other causes. Of those individuals which succeed in reaching the fruit, 50 to 75 per cent enter at the calyx. The remainder bore in from other points, generally beneath a protection such as the contact of a leaf or two apples. Once within the fruit a more or less direct course to the core is taken. Here they feed and grow until maturity. The seed are consumed as well as the tissues of the core, and the destruction of the sap-conducting vessels often stops the further growth of the fruit which fall, from this cause, during July and August. The time required for the development of the larvæ is about thirty days. When full grown the first generation worms emerge from the fruit and shortly spin cocoons under some protection. Transformation into adults takes place quickly, requiring ten to fifteen days. The moths so produced lay eggs which give rise to the second generation worms. The eggs of the second generation are laid largely on the fruit, and frequently in the most exposed places. The young larvæ also appear to manifest the same indifference to shelter and enter the fruit at any point, choosing the calyx only by accident. Codling worms of the second generation begin to appear strongly about the middle of August, but are in evidence, in numbers, late into October. These second brood larvæ are much more numerous than those of the first generation, and cause the most damage. The great majority of the second generation worms have the wintering-over instinct and so do not develop into moths until the following spring. A summer generation requires about sixty-five days, so there is a possibility of a third brood in October.

Sprays applied during the winter and contact insecticides in the summer are of little or no value in the control of the codling moth. Poisoning with arsenic has on the other hand proved very effective when the spraying is done at the proper times. The compound of arsenic should be sufficiently insoluble to enable its free use without danger of foliage injury, and the applications must be made just before the most important hatches of the worms. Numerous compounds of arsenic have been proposed, but at present arsenate of lead meets all requirements best.

Some confusion has arisen from the fact that there are two theories of spraying and two kinds of arsenate of lead. The two lead compounds are known as pyro and ortho arsenates. The pyro arsenate contains a greater amount of arsenic than the ortho compound, and so is a more active poison. It also releases some arsenic to water solution, rendering use in the coast climates dangerous. The ortho compound, on the other hand, is safe under these conditions.

The two theories of spraying have likewise originated under opposite climatic conditions. In the dry interior it has been demonstrated that the calyx cup spraying is most important, and may even be so effective as to render further applications unnecessary. But in the rain belt of the Pacific coast and also in many other sections of the country, the relative value of the calyx cup application is not nearly so great. In California coast districts applications for both broods must be made, and will include three or four sprayings, according to the abundance of the codling moth.

The other caterpillars mentioned in the list of apple insects are normally leaf feeders, appearing in the early spring and coming to maturity before the middle of June. April and May are the months of caterpillars. Many caterpillars have but one generation a year, and this is true of tent caterpillars, tussock caterpillars, and cankerworms. The tent and tussock caterpillars pass the winter in the egg stage. These eggs are deposited on the trees by the moths in June and July, but do not hatch until the following spring. The female moths of the tussock caterpillars are wingless, so distribution is effected by the migration of the larvæ and the accidental transportation of eggs and young caterpillars. Two species of cankerworms are present, called fall and spring cankerworms. Like the tussock caterpillar, the female moths are wingless, but the eggs are not laid in the early summer. One species deposits late in the fall while the other waits until the early spring. The adult larval and pupal stages are passed in the ground under the trees, so the wingless females are obliged to ascend the trunks in order to lay their eggs.

The tent caterpillars and cankerworms injure the trees by defoliation, and must be quite numerous before serious damage is done. Complete defoliation by caterpillars destroys the crop for two years. The tent caterpillars spin a web protection capable of covering the whole colony, and to which they return when not feeding, but the cankerworms live individually, and have the habit of spinning down from the tree on a web when disturbed.

The tussock caterpillar is capable of doing considerable damage even when present in small numbers. This is due to the fact that it attacks the young fruit, eating out portions which afterwards develop into rough scars that detract much from the appearance and value.

Treatment of caterpillars has to be modified according to their habits and character. The tent caterpillar and cankerworms are readily controlled by spraying with arsenate of lead, and so no special treatment need be given when applications are made for the codling moth. On the other hand, the tussock caterpillar is not readily poisoned, and it is more practical to pick the eggs from the trees during the winter than to rely on arsenicals applied later. The eggs are laid in masses about the size of a pea, and may be found on most any part of the tree, often attached to the old cocoons. The white to gray color of the egg masses makes it possible to find them rather readily, but very careful work is necessary with large trees.

Caterpillars are subject to great fluctuations in abundance, due to the attacks of parasites and diseases. These natural enemies may nearly exterminate the species at times, but again their absence for several years allows a destructive increase of the pests.

Coming now to the fungus diseases, the apple powdery mildew is the most important. Under climatic conditions favorable to it, the persistent attacks of this fungus keep the trees from making the proper wood and foliage growth. The vigor of the tree is thus much reduced and many unfavorable conditions develop.

The mildew is a fungus parasite which thrives on the surface of young leaves and growing shoots. It spreads over the attacked parts and resembles a mold, both in appearance and odor. The fungus is propagated and distributed by means of spores or seed-like bodies. These spores, although microscopic, are produced in such enormous numbers as to form a white powder, which is often abundant on mildewed shoots. The spores are distributed by the wind.

Treatment for the apple mildew has, until recently, been impractical, because the fungicides in common use had little effect upon it. Winter sprays have not proved effective because the fungus is in a very resistant state during the dormant period. Sprays, to be effective, must be applied in the spring and early summer, and some form of insoluble sulphur should be used. We have experimented with a large number of sulphur compounds, and the best among them is the iron sulphide spray, now recommended. Three or four sprayings are required, but fortunately these fit very nicely into the codling moth schedule, so that only a small additional cost is entailed. The Bordeaux mixture is not effective.

The apple scab is another fungus disease which may prove serious if there is much rain during April and May, but dry springs reduce the damage to a minimum. This fungus grows within the tissues of the leaves and fruit, and forms spores on the surface which resemble a dark brown powder or soot. The spores are carried by the wind, and when deposited on apple foliage or fruit will start a new infection if sufficient moisture is present. The injury consists in the scabbing of the fruit, and also the killing of the young fruit if a bad attack occurs during the blooming period. Spraying for the apple scab is quite effective if properly timed. Winter applications of lime-sulphur solution check it materially, but a Bordeaux spraying in May is advisable if spring rains are abundant.

The sappy bark disease and wood rot is much in evidence in the humid coast districts. This disease is probably parasitic, although the specific fungus has not been determined. The trouble is active during the winter and almost ceases in the summer. It starts from wounds, and appears first as a puffy condition of the bark, which later becomes watery. The bark dies and the wood beneath is attacked by a rot, which continues from year to year. Large limbs are killed, and the wood rot eventually enters the trunk, resulting in the death of the tree. In treating this trouble the diseased limbs should be cut away considerably below the infection. The disease may start again in the stub, so it is well not to go too far back towards the trunk in making the cuts. Prevention is better than cure, and as the disease starts in unhealed wounds, the removal of large limbs should be avoided, and all pruning confined to branches under two inches in diameter.

We are now ready to consider a schedule of spraying and other treatments which will meet all of the conditions previously discussed. It is important that the sprays used should have as wide a range of efficiency as possible, and at the same time the application be attended with a minimum of injury to the trees.

For winter use the lime-sulphur solution meets all these requirements best. This lime-and-sulphur compound can be used on dormant trees at any strength, but the contraction now recommended for general purposes is 3½ to 4 per cent of dissolved sulphur. This concentration is obtained by diluting one part of the commercial 33-degree Baumé solution with nine parts of water, or preparing a solution by the following formula: Lime 33 pounds, sulphur 66 pounds; boil these together in 50 gallons of water for forty-five to sixty minutes, or until the sulphur is dissolved. After boiling, strain out the coarse impurities and dilute with water to make 200 gallons. This dilution should be applied with great thoroughness, so as to drench the entire surface of the tree. Best results are obtained when a period of dry, warm weather follows the application. For this reason spraying early in December or when the buds are bursting in the spring is usually most effective. The latter date is certainly best for apple scab control. If the greedy scale is abundant, two applications should be made with some time intervening between them.

The lime-sulphur treatment is effective against the armored scales, moss (lichens) and the apple scab, but there may be a few trees which are badly troubled by the woolly aphis. In this case the trunks and large limbs may be sprayed with an 8 per cent distillate emulsion. The application should be made during the coldest weather in December or January, because the colonies of the aphis are then smallest and least numerous. Great thoroughness is necessary in order to penetrate all the crevices in the bark. After spraying, the wet earth about the trunk should be removed. This is a precaution to prevent killing the root crown by prolonged contact with the distillate oil. If the crown is found to be infested with the aphis, it is well to pour several gallons of a strong tobacco decoction into the basin and then refill with new earth. In addition to spraying, the trees should be examined for tussock caterpillar eggs, and sappy bark disease infections. The latter trouble may require several inspections during the winter to prevent undue spread of the disease. Cutting off the infected branches is advised, except when these are large and only have one side attacked. In such cases cut away the diseased bark to healthy tissue, and then watch carefully for further outbreaks.

With the advent of spring the most important consideration is the control of the codling moth, but the powdery mildew is a close second and even more consequential in some localities. We will take up the two cases, first the control of the codling moth alone, and second with the mildew. Provided there is no necessity of spraying for the apple scab, the spring and summer applications will contain only arsenate of lead. Four thorough sprayings with this material, and properly timed, will insure practical control of the codling moth, tent caterpillars and cankerworms, as well as several other leaf feeders. The first application is due when the majority of the blossoms have fallen, from the middle of April to the first of May. The second spraying comes in the latter part of May and the third about the middle of June. It is possible that these three sprayings will be all that is required for the control of the codling moth, but experience has taught us that in many cases this early work is not done thoroughly, and the second-generation worms may be numerous enough to cause considerable damage. To meet this contingency a fourth application of arsenate of lead should be made between the middle of August and the first of September. The correct amount of arsenate of lead to use in all of these applications is about 2 pounds to 50 gallons of water, and the neutral or ortho compound should be chosen in order to avoid foliage injury. Thoroughness of all the applications is a point quite as important as the timing, and failures which have occurred are easily explained as the result of improper use without assuming any fault in the arsenate of lead.

This statement of procedure covers the simplest general condition, but arsenate of lead is an insecticide only, and even its most thorough use leaves the trees exposed to the attacks of fungus diseases. When there is much rain in April and May the apple scab is to be feared, for the lime-sulphur applications in the winter may not have been sufficiently effective to prevent all injury. Under these conditions the first application should include the Bordeaux mixture. A suitable Bordeaux-arsenate of lead mixture can be prepared by following these directions.

Three pounds of bluestone dissolved in 10 gallons, and four pounds of lime slaked and mixed with 20 gallons of water should be poured together and well agitated. The arsenate of lead and water necessary to make 50 gallons is added to this mixture.

Bordeaux may russet the fruit if the application is followed by rains, and bellflowers should never be sprayed with it, as this variety is easily russeted and but little subject to the scab.

The second case to be discussed is that which includes the control of the powdery mildew. This may be accomplished by adding iron sulphide to the early codling moth sprayings, and inserting an additional application. The timing of these applications throws them about two weeks apart as follows: May 1st; May 15th; June 1st, and June 15th to July 1st. Arsenate of lead is used with these applications at the rate of 2 pounds to 50 gallons for the first two, and 1 pound to the same quantity of the second two. The August and September sprayings are to contain arsenate of lead alone.

The iron sulphide under discussion is a complex compound formed by the reaction of the lime-sulphur solution on a solution of copperas (iron sulphate). A 200-gallon quantity is prepared as follows:

Dissolve 15 pounds of copperas in a 50-gallon barrel, two thirds full of water, and then add 13 quarts of the 33-degree Baumé (commercial) lime-sulphur solution; add water to fill the barrel and agitate thoroughly. A thick black precipitate is formed, and, if, as there should be, there is a slight excess of the lime-sulphur solution a reddish liquid will separate. Allow to settle for twelve hours and then pour off as much of the liquid as possible without loss of the black precipitate. Repeat the operation of filling the barrel with water, agitating, allowing to settle and decanting, four or five times, or until the excess lime-sulphur solution is washed away. When the washing is complete the mixture is ready to dilute with water to make 200 gallons of spray. Arsenate of lead is added while diluting, along with the water.

When iron sulphide is used, there should be no need of the Bordeaux mixture, for the results of our experiments indicate that the mildew spray is also effective against the scab. In spraying for the mildew special effort should be made to wet the tips of the growing shoots as these parts most need protection.

The use of iron sulphide for the mildew is just emerging from the experimental stage, but we are prepared to say that young orchards, from the time of planting until coming into bearing, will be greatly benefited by five or six applications, as the growth is greatly stimulated. Older trees are also much stimulated in growth, but the first application is likely to shock the tree and cause the dropping of some of the young fruit. This shock is apparently due to the especially delicate condition produced by bad attacks of the mildew and may be expected to disappear when a normal condition of thrift has been restored.

The following points should be remembered in the use of iron sulphide for the mildew: One or two applications will produce little or no effect, because the infection of the young growth is continuous during the growing period, and so the protection must be continuous. There may be some dropping of the young fruit as a result of the use of the spray, but this loss should be compensated by increased growth and vigor resulting in better future crops.

The discussion of these general methods of procedure for the control of the most important apple pests is scarcely complete without considering some of the special problems which may come up incidentally. The woolly aphis was mentioned under winter treatment, and the statement was made that this insect might require further treatment during the summer. Aphids of various species develop rapidly at times, and the apple in California is subject to the attacks of at least three. The woolly aphis, green aphis, and leaf-curling aphis may all become abundant enough at times to inflict serious injury. These insects are all soft bodied and easily killed with contact insecticides when actually hit by the spray. On the other hand, multiplication is so rapid that a few remaining individuals can quickly reinfest the tree. For this reason it is unreasonable to expect any one spraying to control aphids for the whole summer, unless the application happens to be so happily timed as to reduce the numbers of the insects to a point where some natural enemy or condition, already struggling with the pest, can conquer them. Natural enemies of the aphids usually get the upper hand in time to prevent very great damage from these pests, but a few trees may suffer greatly from attacks of plant lice, often the same ones year after year. In such cases treatment is advisable, and sprays should be applied whenever conditions require.

In spraying for aphids it is necessary to use large quantities of the wash, forcefully applied, from all directions, in order to insure contact with the bodies. For this reason the spray material must not only be a good insecticide, but also free from foliage injuring properties. The best aphis sprays that have come to hand are the nicotine and tobacco washes. Nicotine is effective against aphids when used in dilutions as great as fifty hundredths of 1 per cent, and is not known to injure foliage even at much greater strengths.

Tobacco decoctions containing the required amount of nicotine can be prepared from refuse stems, dust, etc., and a wash strong enough for aphids is obtained by steeping a pound of such material in a gallon of hot water for several hours, then diluting with an equal quantity of water after straining. The addition of some soap will much increase the efficiency of the spray, as it gives better contact and helps to retain the nicotine. A pound of soap (whale-oil or other) to 20 gallons makes a good mixture.

Spraying is at present the main reliance in the control of apple pests, but there are cultural methods and ways of handling the fruit which may add materially to the total results. Thorough thinning of the young apples makes protection by spraying much easier as the points of contact, which afford protection to the worms, are not so numerous. The complete and immediate removal of the fruit when picked is also a good practice for most of the wintering-over generation worms are still in the apples. This is especially true if the picking is done before the middle of October. Often the good fruit is quickly removed, but the culls and windfalls are allowed to remain and rot on the ground. This is a bad practice and may be the means of harboring more than one pest. This cull fruit is now becoming valuable for drying and canning purposes, so there is a greater disposition to make a thorough clean up with consequent improvement in conditions.

In closing this paper I feel that much of importance has been left unsaid. There are many pests of the apple which have not been mentioned. Fortunately, a number of these are not present in our orchards, and we are trusting in an efficient quarantine service to keep them out. In the mean time knowledge of methods of control both by artificial means and the assistance of natural agencies is making rapid progress. What has already been done gives us confidence in our ability to cope with most, if not all, contingencies and assures the future of the industry. (Applause.)

PRESIDENT JEFFREY. Colonel Irish will now speak on the subject, "After Fruit Production, What?" (Applause.)

MR. IRISH. *Mr. Commissioner, and Ladies and Gentlemen:* Before I begin speaking you will permit me to say something. There has arisen, not only in California, but throughout the republic, a problem that has been for years under observation, which concerns very materially, not only the economics of agriculture and horticulture, but the social and general life of the people. This problem is the lapse of the young of the country, reared under rural conditions, from those conditions to the city. In the period of our Revolutionary War only 3 per cent of our people lived in cities, and 97 per cent of the men of brawn and the women of courage who went through that great struggle in which our liberties were established were rural people, living under country conditions. Now nearly 35 per cent of our population is in cities, and that population is on the increase yearly. This lapse of young life from rural districts and rural occupations is a problem that is being considered by economists and publicists all over the country.

There is no doubt that man—ancient man—regarded his relation to the land and its fruits as one of the most important to him. In that book of Genesis, no matter what opinion we may have of its authenticity as an historical narrative or of its value as an inspired book, there is something that appeals directly to all men, and that is that part of a tradition that is traced away back into Assyrian sacred literature, in which an attempt is made to account for the presence of man upon the earth as a part of the universe. As I say, whether it be of value as an authentic historical statement or not, it is of the highest value to every thoughtful person as an expression of ancient man's opinion of what constituted nobility of descent. It is in that verse, "God created a garden eastward," and that was Eden, and out of that garden, equipped with everything that grew upon the ground and upon vines and trees—except, perhaps, with the loganberry, which is a modern creation—in that garden man concluded he would place his origin, his initial point. It has, I say, the highest value as an expression that ancient man believed in his descent from the soil. Now we are starting away from that ancient idea. The young of the country do not place that high value upon descent from the soil that ancient man did. In your country schools and in your schools in cities like this, a boy may learn, in the literature with which he comes in contact, all about the glory that was Greece and the grandeur that was Rome; he may learn all about wars and captains and commanders; he may acquire, through the observation of literature, a knowledge and fondness and an imaginative tendency toward every occupation on earth except the rural industries. He picks up a city newspaper—we call it a metropolitan paper—and what does he read? He reads there the pleas of lawyers made to juries and to courts; he reads the sermons of gifted preachers; he reads about the cures and great achievements of physicians and surgeons; and when he looks through that metropolitan paper for something which relates to the occupation in which his father is engaged, he finds the farmer pictured as a hayseed, wearing whiskers cut on the pattern of a goat's, with a toothpick in his hand and saying "By Heck" and "Gosh-all-hemlock." [Laughter.]

Now, what is the effect of all this? It is to captivate the imagination of the boy with the glories and the splendors of the city, of the excellence of the work in the professions, and to inspire him with contempt for the occupation of his sire, the old hayseed with a goat beard on his chin, chewing Star tobacco and saying "By Heck" and "Gosh-all-hemlock." That is what he absorbs from the literature with which he comes in contact. The only way to train a child is to train him when he is young. One wise person went further than that when penal reform was under discussion, when he said, "The way to begin reforming young Smith is to reform his grandfather." But in this respect it is time that the people of this republic teach, through all the agencies that instruct the young, that there is something in the world besides war, that there is some glory beside that won by commanders who lead hosts to slay. It is time that we began in our schools, both country and city, to teach that the foundation of all things is in the tilling of the soil and that, therefore, to the tiller of the soil is due the first honors. It is time that we should go back, if necessary, to Virgil and Pliny Secundus and have some man among us who shall originate a literature that shall teach the utility, the romance, the imaginative elements that are in the rural occupations of the republic in every one of its states, so that, through the literature absorbed in the schools, our young may find out something about that great industry upon which all other industries depend.

"God planted a garden eastward in Eden." It was a garden. How inane and silly that line would be if in Genesis it had been said that God planted a brewery eastward in Eden or a drug store or a lawyer's office [laughter], or something else of that sort, but he planted a garden completely stocked with things that grow in the ground, and it is well to go back to that. The Agricultural Department in Washington, to which we owe not only the millions and millions that it has added to the crops of this country by increasing the fertility of the soil, but a mighty stimulus that has gone through all the nerves of the agricultural and rural people of this country, a stimulus that is beginning to teach them that scientific agriculture is one of the highest of all the arts, that it deserves to rank with what we call the learned professions, with law, physic, and theology. We owe all this to the Agricultural Department; but that corps of splendidly trained gentlemen in that department have observed the necessity of beginning in the schools of the country, teaching the young something that will interest them in agriculture, and to that end that department has undertaken by the spread of bulletins to impress upon the people of the country especially the need of introducing something about agriculture and horticulture and their allied arts into the public schools.

Why, think of it. You just listened here to a splendid paper that will go into your transactions and be a text-book upon the subject, a splendid paper upon insect and fungus pests, involving that most interesting subject, vegetable pathology. We call the doctor who cures us of a stomach ache or a soft corn or an ingrowing nail or something of that kind. The vegetable pathologist, who finds out vegetable diseases, is following a profession much more difficult to practice successfully than that of the physician, because we can tell where our pain is, which rib hurts and where the rheumatism is attacking us and in what kind of weather, but the vegetable can not utter its complaint. The study has to be entirely from the external, and vegetable pathology opens out to young men with a scientific turn one of the most important fields of human endeavor, relating to the stability of our crops and the volume of their production.

In your Agricultural Department in Washington some years ago, when they began on vegetable pathology, they found one man in the United States who was a vegetable pathologist, and at that time the munificent salary attached to that position was $1,800 a year; and that man went into a pathological laboratory and patiently began his labors for that small salary. Pretty soon the observant government of Japan got its eye upon him, and there they must make every square inch of soil produce all the food it will, and their rice and other food crops were afflicted with diseases, and that government knew that it must find a vegetable pathologist that knew what those diseases were and could suggest their remedy, and so that government picked up this man from the Agricultural Department getting the munificent salary of $1,800 a year and took him to Japan under a seven-year contract at $7,000 a year. So, if we begin in our public schools teaching the rudiments of agriculture and horticulture, teaching the labor that should be done at seed time and at harvest, but teaching the necessity of studying the enemies of that crop who reduce its yield, which reduce not only the profit of the producer, but the quantity of food that will go to the mouth of the consumer, pretty soon the country boy will look upon his old father as something more and better than a hayseed and will listen, not with disgust, when the old man does say "By Heck" and "Gosh-all-hemlock." In order to effect this the Agricultural Department has begun a propaganda. It has issued a series of very interesting bulletins and pamphlets on the subject. It sent me the other day a few of them and I will leave them here, and I want each one of you to get a copy as far as they will go. There may be some men here who are school directors in rural schools and city schools. And another thing. These same things relating to agriculture and horticulture should be introduced into the city schools to let the city boy know that there is, beyond the limits of his town, pursued by faithful and toiling men and women, that occupation, the tilling of the soil, which George Washington said was the most noble, the most healthful and the most useful occupation of man. And so instead of the lapse of the country boy to the city we will have a hegira of the city boy into the country, led there by having his imagination fired by the story of rural life. Now, that is what I wanted to say. Now I will go on and speak. [Applause.]

"After Fruit Production, What?" Gentlemen, the time when roast pigs all stuffed and seasoned were running around the county roads in California begging people to eat them has gone by. [Laughter.] The representation to a coming stranger who desires to invest in land that all he has to do is to buy a piece of California land and sit down and look at it and it will make him rich, should cease. The State Board of Trade, of which I have been a director with Mr. Briggs and Mr. Maslin and other gentlemen for the last twenty years, esteemed it its function for some time to promote the fruit industry and fruit planting. Some time ago, however, we consulted upon that subject, and we made up our minds that the time had come to cease promoting the expansion of production in this industry, that the attention of the people should be turned to something else; that an industry which was shown by my friend Russ Stephens yesterday can not stand a freight transportation to its market of one cent and fifteen one-hundredths, and that even a transportation charge to a market 1,300 miles away of one cent per pound will not prevent loss, that industry must turn its attention to something else than the expansion of production. It must turn its attention to a market, to the means of reaching it, and to holding that market profitably. So the State Board of Trade concluded that the best thing to be done by the fruit men of California is to stop talking of expansion, the extension of plantations, and to devote itself to the production of quality, to the standard packing of its fruit, and to reaching a market that will take its product at a profit to the producer, and that market when reached will be subject to expansion in its turn. Let production stand where it is, then, and let us devote ourselves to a profitable expansion of our market, and when that expansion of the market has caught up with production, then naturally it will be business in California to begin to talk about expanding production. But first catch your market, let it expand up to the present supply that you have, and when that has been done then every acre planted after that will promise to its planter a profit after coming into bearing. So the State Board of Trade has devoted itself to the fruit industry faithfully and honestly in its statistical statements, but it has begun to encourage other forms of rural industry in California with the same vigor and energy and truthfulness and confidence with which it formerly encouraged the fruit industry, but standing ready to help it take care of itself, as Mr. Briggs will tell you later on, standing up and resisting the encroachment upon it threatened in the sulphur matter, enabling it to reach its market, to reach a profitable disposition of its product, but letting expansion wait until the market has been found and has profitably expanded up to our present capacity of supply.

Now, in the first place, I think that it is highly necessary to study the standardization of the pack. In that respect no one can estimate the value of the work that is being done by Mr. Jeffrey. He is holding meetings, which I have attended in many instances, among the fruit growers, preaching to them the absolute necessity of observing commercial honor in their pack. You must first have a pack that is of the character and quality demanded by the distant market, and that character and quality must be carried to that distant market. You will not be confronted when there with: "I have bought some boxes of Watsonville apples since they began coming into the market this season, and I found the top layer splendid, but the other layers were a disappointment." Let the growers organize. That has been talked to you here and the example of the citrus growers of southern California has been held up to you. Let the growers organize, let them make an ironclad organization, but when they have made that let them understand that they must not use the power of organization to force upon the packer inferior qualities of fruit. A great many men feel that when they belong to a powerful organization they can compel the packer and the final factor, the consumer, to take what they choose to bring. You have borrowed that from the labor unions. When the mechanic depends upon the power of the union behind him and not his skill or fidelity he will exert neither skill nor fidelity. We who live in cities know this to our sorrow. But you must discard this leaf out of the policy of the labor unions and use your organization to compel every part if it to observe the principles of commercial honor when you take your product to the man who is to be the factor and send it to the distant market. [Applause.] We often hear—and I have had some of the same experiences—about the sins of the commission man—and his sins are as scarlet, there is no concealing it [laughter], but the commission man is a psychologist; he has had experiences with many and many a rural producer and he knows that that rural producer, if he can do it, will send him a Christmas turkey with a stone hidden in its insides or he will send him inferior fruit; and so when the man from the country gets back no profits for his shipment, but a bill for his freight and goes down to jaw it out with the commission man, the still small voice of his own conscience tells him that he didn't do square with the commission man in the first place. Be square with yourselves, absolutely, and you will be astonished to find out how soon you can make every other man be square with you. Be square with the consumer, with your commission man, and when you make your organization make it ironclad, and demand that it shall compel every member of it to be square [applause], and when you do that you have taken the first great step that will lead to your prosperity and your finding of a market. In the first place, then, the standardizing of your pack, to get to the consumer in the very best condition, the very best quality that can be produced. Then attend to your transportation matter. I don't think you can ever get the railroad companies to go into partnership with the fruit producers in California. I have this criticism to make of what Mr. Stephens' committee has done, that it is continually saying to the transportation companies, "We want you to give us a rate that will protect us from loss." Suppose the railroad company says, "All right, gentlemen, we will do that, and then when we protect you from loss we want you to divide the profit with us; we are in partnership." That won't do. I don't think that transportation anywhere in the world is done upon that system or that principle. I sympathize greatly with your effort to get the lowest transportation rate possible to reach your distant market. When the interstate commerce bill was under discussion I was editing a newspaper in San Francisco, and when it was under discussion before congress to fix a uniform rate per ton per mile all over the country, I saw at once that that spelled ruin for the California producer, that there should be a differential permitted upon a long haul, and that a long haul should be made by a railroad upon a less rate per ton per mile than a short haul. And so I went to Washington and I dealt with Mr. Reagan, of Texas, and other gentlemen, and perhaps had a small part in procuring a differential, a less rate per ton per mile upon a long haul. Now, what did I find out? Here were the fruit growers of Georgia, the orange men of Florida, the apple growers of Nebraska and Iowa, fighting like soldiers against that differential clause. Why? Look at it as it is to-day. You will find those men, when a train of California fruit goes by, frothing at the mouth because, after all, it is going to the market at a less rate per ton per mile for the long haul. They have the short haul and you have the long haul. There are so many intricacies in the fixing of the freight rates that I think we would all be fit for the insane asylum if we should try to straighten it out; but certainly, the voice of a great industry that supplies so much profitable tonnage to the railroads that reach this coast must be heard in reason by the men who control the policy of the transportation companies that carry that product to market, and I am satisfied that sooner or later you are going to get your rate, not in partnership with the railroad companies at all, but by their fixing a rate that they will be justified to their stockholders in fixing, that will greatly approximate your desires, and when you get that rate don't profane the arrangement that has been reached by so many prayers and tears and sacred and profane methods, as that will have been reached—don't profane it by making it the vehicle of sending to your market inferior product.

I have long been satisfied that there is in the world a profitable market for every pound and pint of California fruit product, either in its primary or its secondary or its tertiary forms. That market you should reach but you must reach it, as I say, with your product in first-class shape. Why, see how easy it is. Some years ago, when the late J. Sterling Morton was Secretary of Agriculture, he visited this coast and we gave him a reception in the State Board of Trade, and he was asked to talk about the marketing of California fresh fruit in London, which had begun not long before, and he stood up and told the story. He said when the sending of California fruit to London began he sent two representatives of his department there to study the effect when it landed. He said when the first lot was exposed for sale in London it was found that there was one lot of fruit that was absolutely perfect in quality and in packing, and that sold for the highest price. The next shipment came along, another lot under the same brand, and that was opened and found in exactly the same condition as to quality and pack. When the third shipment came the fruit under that brand sold at the highest price without the package being opened; it had established its reputation. He was asked whose fruit that was and he said Frank Buck, of Vacaville. He had by that simple process established his trade-mark in distant London. At the end of the season of 1894—it had been a hard year for all of us, the year of the railroad strike—I met Flickenger, of San Jose, the canner, and I said, "I suppose you are busted, like everybody else." He said, "No, I sold my pack at as good a price as ever and I could have sold a hundred thousand cases more if I had had the goods under my brand." I said, "How do you do it?" He said, "I have a market in Europe, Asia, Africa, and the United States, and I have taught my market that everything under my brand can be bought without opening a can and the customers will be satisfied." There can be a trade-mark and a brand established for the entire State of California, so that the word "California" upon a package of fruit or a can or a box of dried fruit can be a trade-mark so thoroughly established as a legend representing commercial honor as that every bit of this product going out of California will be taken by the market without examination. When you do that, when you reach that high plane, you have done, in my judgment, the first thing that is necessary for protection. Reach your market in that shape. Let production stand where it is, without further expansion. Wait until that market so reached is absorbing all you send to it, and then you can begin to talk about enlarging. Then you can begin to encourage the stranger to plant trees and vines, and not until then.

So, as I say, the State Board of Trade is showing that we import into California every year five million dollars' worth of dairy products, and we are saying to the people, "Plant alfalfa and get cows, milk them to get the cream and feed the hogs skim-milk." Let us turn the attention of the stranger to other things than fruit. It is conceded by the world, we have established it, that there is no equal area on the surface of the globe that can produce in perfection as many varieties of the fruit tree and vine as can California. We have talked that universally, now let us send that product to the world in such condition that it will learn to depend upon us entirely for its supply of that form of food, and meantime devote our attention to the other things that are profitable in filling the gap of five millions a year in dairy products and other millions in pork products and that will yield a profit. Let us expand in that form and then it is very easy, when our fruit market has reached the limit of our supply, to begin to expand the supply.

Now, this is a very discursive discussion. I envy a man who can write a paper and stand up and read it. I can't and never could, and the result is I never became a writer and never became a speaker. But bear in mind what I have said to you about the schools. I remember the joy that came into my heart when my only boy, a college boy with an opportunity to train for a profession, was visiting my ranches and tramping over my land and seeing seed time and harvest, had born in his heart an irrepressible ambition to become a land man and a live stock man, and when he left college at the close of his training in elementary law and took up land and live stock I was the happiest father in California. [Applause.] And so, let me tell you. Take this home with you and don't forget it, that every father and mother in California, both in city and country who finds the mind and the taste of the boy turned toward the country and toward land and toward the rural occupation should be as happy as I, because Washington told the truth when he said agriculture is the most useful, the most noble, and the most healthful occupation of man. (Applause.)

PRESIDENT JEFFREY. Mr. McAdie, of the Weather Bureau, is here and he will speak, and you will be pleased to hear him. His subject is "Protection from Injury by Frost." (Applause.)

PROTECTION FROM INJURY BY FROST.

By PROF. A. G. McADIE of San Francisco.

In our attempts to prevent damage by frost in California the first question to be answered is, What is needed? A cheap (the meaning of this word to be given later), easily handled, effective means of preventing rapid cooling during the night and early morning hours. Also, we must prevent excessive drying of the plant tissue previous to the fall in temperature and excessive warming of the dried, chilled plant after the frost. Briefly, we must shield fruit and leaf from abnormal strains, caused by rapid changes in temperature and humidity. In nearly all the papers heretofore written on "Protection from Frost," attention has been given to temperature changes, but very little has been said about the condition which so frequently precedes frost; namely, the drying. In California our frost periods are nearly always preceded by a day or two of boisterous north winds, quieting down at nightfall. These winds, we have good reason for believing, rob vegetation of much of the natural moisture and probably leave plants in no proper condition to withstand the rapid cooling of the quiet night hours following. The plants are also in no condition to withstand the rapid warming after sunrise, when the sun's rays fall through a dry, clear atmosphere. At such times there is nothing to intercept the sun's heat, practically no atmosphere absorption and no gradual heating, to which the plant might accommodate itself.

Our attention has been drawn to the importance of this drying effect preceding frost by the damage done during the cold spell of December 19-20, 1908. Strong desiccating winds blew down the San Joaquin Valley for several days before the freeze. My belief, expressed popularly, is that the ground was dried out, the trees in large measure overstimulated in the effort to meet the intense evaporation at the leaf surfaces. Then when the excessive metabolism could not be longer maintained there was inadequate exudation, and shriveled plant tissue resulted at a time when it was most necessary that the plant should have a good supply of water to enable it to resist rapid temperature change. Again, it must be plain that such dried, chilled tissue is in no condition to withstand rapid heating. There is some evidence to support these views in the well known fact that frosted oranges, for example, are somewhat dried and do not regain their natural juiciness by remaining on the trees.

If this view be correct, it is plain that in any campaign of frost fighting we must not neglect this antecedent condition of drying and the consequent condition of rapid thawing.

The general campaign of frost fighting, as thus far laid out, covers three main lines:

1. Accurate advance information of the occurrence of frost.
2. Applying preventive measures during critical hours.
3. Preventing sudden warming of chilled fruit, or a too rapid thawing out.

Under the first of these heads great progress has been made in the past five years. Not only in California, but now throughout the various fruit sections of the United States, Weather Bureau officials recognize the value of special study of types of frost maps. The work first undertaken in California on a large scale, and for a distinct purpose, is now an important feature of the forecaster's work at a large number of places. Frosts are found to occur as a consequence of certain movements of low and high pressure areas and the displacement of the lower air incident to the pressure changes. Frost is a matter of *air drainage*, both on a large scale and on a small scale. In other words, frosts are successfully forecast because we understand the general movements of the lower air and in particular certain local circulations. Types of frost maps, that is, conditions preceding frost twenty-four hours, are shown herewith.

The forecaster anticipates a condition in which the lower air strata are quiet, dust-free, and very dry. Under such condition there is rapid radiation and loss of heat from plant and ground and a sharp fall in temperature. While the forecaster gives the general conditions favorable for frost, it must be clearly understood that each individual orchardist must study his own problem of air movement in his own locality. These local circulations should be studied in connection with the daily weather map. It is also advisable to have certain instrumental records, such as are given by the thermograph and hygrograph, the importance of which data will be apparent from the discussion further on.

Under the second head, we must discuss some of the physical processes operative in the formation of frost and then mention the various devices, such as smudging outfits, coal baskets, oil pots, orchard heaters, anti-frost covers, etc. Opinions will differ as to the relative efficiency of various devices, and some are undoubtedly more serviceable for certain localities than others. We propose to discuss the principles rather than individual devices.

There are three general principles used in frost-protection devices:

1. Adding heat.
2. Saving heat.
3. Mixing, or stirring the air to prevent cool areas.

Under the first are included all the various forms of heating devices, such as open fires, smudge fires, coal baskets, oil pots, orchard heaters, etc. The use of fires probably dates back beyond our memory, but the first use of the coal baskets for the specific purpose of preventing loss by frost was by Edward Copely at Riverside, Cal., about 1896. The first use of oil that we have a record of was by Everett at Arlington, Cal., and the first use of hot water was by Meacham at Riverside. A severe frost about the end of December, 1905, caused great damage to the orange crop in the Riverside section, and the following year may be said to have marked the beginning of the frost fighting campaign. The Riverside Horticultural Club took an active interest in the problem, and many experiments were conducted by such men as those already mentioned and Koethen, Reed, Holmes, Hall,* Hammond, and McAdie. The work has gone on and there are now on the market many forms of heating devices. A convenient and serviceable frost alarm thermometer and oil pot were devised by the Weather Bureau official at Fresno, Cal., Mr. J. P. Bolton, for use in the vineyards during the spring frosts. There have recently been put upon the market orchard heaters, burning oil, and the claim is made that in the apple sections of Colorado and other Rocky Mountain states results have been most satisfactory. These are known as the Troutman Orchard Heaters, burning oil, and used variously, forty to a hundred to the acre.

Direct heating by large open fires is not recommended, as experience has shown that the heat is radiated largely upward and is not effective in warming the fruit. I may illustrate this by the following experience of one of the most intelligent horticulturists in California. Mr. J. S. Douglass of San Emigdio Ranch writes that during the night of December 20 and 21, 1908, the temperature for fourteen hours ranged between 19° to 24° F. For thirty-six hours the temperature did not rise about 28° F. About fifteen cords of wood and forty tons of wet hay were burned in the effort to protect the orchard. The relative humidity was low, there was little air movement, and the smoke rose as straight as a pine tree. At the intersection of two roads in the orchard there was a large fire and thirty feet away a thermometer was placed on an olive tree. A second fire was burning twenty feet away from this tree in another direction, and a third fire twenty-five feet away in still another direction. The temperature at the tree, however, remained at about 20° F. from 3 to 8 a. m. December 21st. This was the coldest weather in this locality since 1888. It is evident that in this case a large amount of heat was lost.

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*And others whose names I can not now recall.

Many small fires are much more effective than a few large fires. In the use of numerous small heating devices, it is possible to distribute the heat where it is most needed. It is also possible by increasing the number of wire baskets, oil pots or orchard heaters to offset a continuing fall in temperature. It should, however, be stated that with most oil pots, unless the combustion is excellent, there is a deposit of soot which may settle on the fruit.

Under the second head, that of saving heat, we have all the various smudging devices for artificial cloud making and all the different forms of covering. The object, of course, is to utilize the earth's heat as much as possible by entrapping it. Any cover spread above the ground interferes with loss by radiation; and the most effective protective methods have rightly been based upon this saving and storage of heat. To be thoroughly effective, however, the cover should be spread before the earth has lost most of its heat. This is the fault of most smudging efforts; namely, that they are begun too late. The cover, or shield, has another advantage in that it serves after sunrise as a guard against the too rapid warming of the chilled plant after sunrise. We have examined many orchards in California and found that fruit was most damaged where exposed to the direct rays of the sun. While it is not definitely known what action causes the death of the cell, whether it be a rupture of the cell walls or a separation of the water and absence of the necessary turgidity, it would seem that we could not err in guarding the plant fiber from strain due to rapid and unequal heating while still chilled.

Of the various forms of cover devices, the lattice work is probably the most expensive; but certainly the most effective.

A new form of cover, known as an anti-frost cover, was devised last year in the San Francisco Weather Bureau office. It is, however, better suited for the protection of small fruit, garden flowers, and vegetables. It is an old and widely known practice to cover garden flowers with newspapers when frost is expected. In the new anti-frost cover there is used instead of a single cover a double layer of prepared paper with an intervening air space. This prevents almost perfectly the escape of the long heat waves from the ground. Such covering can be spread above the plant an hour or two before sunset, *i. e.*, before the ground has lost much of its heat. If at the same time shallow pans of warm water are placed under the cover, an effective screen and serviceable supply of water are provided. It is also to be noted that we use this cover at a time when the roots are absorbing vigorously and transpiration by the leaves is at a maximum. We, therefore, prevent any lowering of temperature at the leaf surface and store up in the plant a quantity of heat energy for expenditure slowly through the night hours. The actual temperature of the air is of less importance than the temperature of the leaf or fruit surface. A deposit of moisture is advantageous.

A special use of the anti-frost cover in connection with tree fruits is to unroll the covers in the orchard before sunset and to roll them up about 4 o'clock in the morning.

Under the third head, methods based upon mixing or stirring the air, no special devices that are available and practicable are known. When nature mixes the air, *i. e.*, on windy nights, frost does not occur. It is now known to meteorologists that layers of air of different temperature may lie close to one another without mixing. On nearly every frosty night there is a difference of 6, 8 or 10 degrees in temperature between the ground and the air ten feet above, the warmer layers being above. Where air is well mixed and there is good ventilation, we seldom find frost.

Finally, in our opinion the ideal frost protection method will be a combination of a cover, a heater and a ventilator, and if the views advanced at the beginning of this paper are correct, as to injury caused by desiccation, it will also be necessary to provide for water in proper quantity.

To sum up, the fruit grower should:

1. Watch the weather forecast closely.
2. Study local air circulation.
3. Use a thermograph in the orchard and study the temperature record.
4. Experiment and determine for his particular crop the most suitable heater, cover or watering device.
5. Do not give up the fight against frost, because of a first failure.

PRESIDENT JEFFREY. We will now have the pleasure of hearing from Mr. Arthur R. Briggs, the President of the State Board of Trade, upon the subject of "Sulphuring Fruit."

SULPHURING FRUIT.

By Arthur R. Briggs of San Francisco.

Mr. Chairman, Members of the Fruit Growers' Convention, Ladies and Gentlemen: It is always a bad plan for one to make excuses, but private matters have been thrown upon me during the last month to such an extent that I found it necessary to digress somewhat from the program that the Chairman had made out, namely, I was set down for a paper on the sulphur question, and that paper is in my mind rather than in my hand. If I was as good a talker as Colonel Irish, who has just preceded me, I pledge you I would not work for a living. Fortunately for me this morning, he has paved the way for me by telling of the great industry which you are considering, its importance to the State, and what should be done with it. He has left for me merely the prosaic portion of the work—that is, to tell something of the history of the sulphur question and its present status.

You are doubtless all aware that the Federal Pure Food law was passed in June, 1907. You are also aware what consternation was felt in California among the fruit growers when the first decision, known as the food inspection decision No. 76, was issued by the federal department. That order was issued by a commission constituted by the law itself, which commission was composed of three cabinet officers, namely, the Secretary of Agriculture, the Secretary of Commerce and Labor, and the Secretary of the Treasury. Two of these officers knew nothing of the fruit business, knew nothing of the effect the order issued would have upon that business, and, therefore, the responsibility fell upon Secretary Wilson, the chief of the Agricultural Department. When that order was issued which prevented the sale and distribution of fruit products that carried a larger per cent of sulphur dioxid—the residue after sulphur is used in curing fruit—of 350 milograms per kilogram, or thirty-five thousandths of one per cent, it was immediately discovered that so small a portion of sulphur dioxid was less than that found in any of the cured fruit as it went to the market. About that time, at the instance of fruit growers and fruit distributors, a convention was called at the California State Board of Trade in San Francisco to consider the question and to devise a method of relief, if such relief was obtainable. That convention went carefully into a discussion of the merits of the case and resolved, after a day's discussion, that the proper way to handle the matter was to select or appoint an executive committee to take the matter in charge, and who should have power to do what they deemed to be the proper thing under the circumstances. I was made the chairman of that executive committee, not with the expectation of becoming an important factor in the work, but in order that there might be a central point from which this executive committee could work. My expectations were not quite fulfilled. I was immediately appointed a committee of one to proceed to Washington, take up the matter with the Agricultural Department there, and see what could be done toward a modification of this ruling of the department, No. 76. I was accompanied by a Mr. Brailsford, who was appointed by the Chamber of Commerce or Board of Trade of Kings County, they bearing his expense. We proceeded to Washington, waited upon the Secretary of Agriculture, who at first was not very much inclined to heed the suggestions we made. But I want to say to his credit that at the third interview we had with him and with the Solicitor of the Department of Agriculture, we procured from the department a modification of order 76, exactly in the nature and terms which we asked for. We were able to convince Secretary Wilson that this great fruit interest of California, which the people of this State have for years—a quarter of a century—labored to build up, was menaced to such an extent that in many respects it will be paralyzed if order 76 prevailed. Later—only a very short time later—through and by a letter which I prepared and forwarded to Senator Perkins—the dean of the delegation from this State in Washington—an application was made to the Secretary of Agriculture, a copy of which was sent to President Roosevelt, in which letter the whole matter was presented in a way that seemed to carry conviction to both those officers. President Roosevelt, with his usual earnestness and prompt action, determined that something more than was being done in the Agricultural Department or than could be done through the Bureau of Chemistry of that department, was necessary, and immediately created a commission known as the Referee Board. That board is composed of five as expert scientific chemists as there are in the United States, and after this board was created the whole matter of the use of sulphur and of benzoate of soda was referred to them, and on the action of that board would rest the determination of our industry here. The appointment of this board excited somewhat the opposition—I might say the enmity—of Dr. Wiley, the chief of the Bureau of Chemistry of the Department of Agriculture. He declared in his contention that the use of benzoate of soda in the curing of such products as peas, cherries, tomato catsup and others, was absolutely wrong; that the products manufactured by the use of it were poisonous, and that it lay in his power to prohibit it. He likewise declared that the use of sulphur in the curing of fruits in this State was not necessary, that fruit so cured was not wholesome, and its use should be prohibited and *was* prohibited by the ruling or decision No. 76. No argument, no appeal, seemed to reach Dr. Wiley. He had taken his position and openly and persistently declared that it was the fight of his life and he would maintain that position. I therefore abandoned further effort with Dr. Wiley and immediately placed myself in position to confer with the Referee Board, and learn from them the policy which was to be pursued. I returned to California confident that the fruit interest of the State was not to suffer, at least, for a period of twelve months. I took occasion to issue a bulletin immediately on my return to assure fruit producers, fruit dryers and distributors of their freedom from any action on the part of the Federal Government so far as the crop for 1908 was concerned. I have the pleasure of knowing that Secretary Wilson, who gave this assurance, kept his word fully and that no interference was had on the part of the government in the distribution or curing of these foods.

When the matter which I have referred to was passed first to the Referee Board it was decided by them that the use of benzoate of soda—being thought to be of the greatest danger—would be first to be considered by them. The five laboratories represented by these scientific and eminent men were, therefore, put to use at once, separately, so that each might make his own examination and determination without reference to the others; for six months these examinations were carried forward by the members of this Referee Board.

You will understand that some anxiety has been felt on the part of all of us and particularly by these who have been closely identified with this movement since the beginning.

When the Referee Board visited California in the early part of the curing season of 1909 it was not known that the finding had been made with reference to the use of benzoate of soda, but it was supposed when the report was made it would be published as a whole and the recommendations of the board would be made on the full finding. But when the board was here it was disclosed that the examination and determination had been made with reference to benzoate of soda and that report was adverse to the position taken and held by Dr. Wiley. Dr. Wiley, knowing this, took every method known to him to circumvent and to discredit the Referee Board, so that its report would not have the effect it was thought it would have. At the National Food and Dairy Congress, held in Marquette, Michigan, late in 1908, a bill was prepared and introduced to the congress there and forced through, which it was sought to have passed by the legislature of every state in the Union, and that bill was of such nature and character and kind as to practically prohibit the use of these chemicals in the curing of our goods. It was necessary, therefore, to circumvent Dr. Wiley somewhat in this regard, and the matter was taken up, after procuring a copy of the bill which he proposed and had sent to many of the legislatures of the states, and the request was made of them to withhold action until the Referee Board, to which this matter had been assigned, made its report and recommendation. The legislatures of the different states paid the compliment of declining to do anything with Dr. Wiley's bill which he said was so necessary, and it did not pass in a single state in the Union.

The next annual meeting of the National Food and Dairy Congress was called at Denver, in September last. The Referee Board was invited to be present, not to make its report to that body, because it had no right to do it; its report was to be made to the Federal Government and to the authority that had created the board, but the purpose was, as discovered later, to assail not only the integrity of the members of that board, but their efficiency, and thereby to discredit whatever they did and to create an impression that Dr. Wiley was right. I confess that I wanted to be, and sought to be, a member of that congress. I carried from California an appointment from Governor Gillett, the Governor of this State, an appointment from the State Dairy Bureau of the State, and an appointment from the California State Board of Trade, three appointments from three central authorities, with the thought that if there was any effort on the part of that congress to disqualify me, my credentials would be of such character as would make it impossible. I found that I was somewhat mistaken. It was not a question of courtesy to our Governor nor to these other bodies, it was not a question of right—it was a question of a determination on the part of one man to dominate the congress and to carry the point which he intended to make. With me went Professor Jaffa of the University of California, but he, having been appointed by the authorities under the Government, was seated and had his vote in the congress. Mr. H. P. Dimond, who accompanied me, carried only the appointment from the Governor. Mr. Dimond and myself fought for one day and one half, in season and out of season, before our credentials were admitted and we were given our proper place on the floor. The purpose of all this is, and I am telling it to show that the conclusion I have reached will before I finish perhaps seem justified: In that congress, each state having three votes, the vote on all critical points without the vote of California, stood 44 to 44, 88 votes being the full number of votes in the congress. If the delegates from California could be disqualified, Dr. Wiley could carry his point. But after we were seated as delegates the vote on all critical questions stood 47 to 44. I tell this to show how nearly we came to losing the point we were trying to make, viz., to support the action of the Referee Board, in whom we had confidence. I said on the floor of that congress that it mattered not what the finding of the Referee Board was, the people of the State of California and the fruit growers of California had expressed their confidence in the ability of those gentlemen, in their efficiency and in their honesty, and whatever the finding might be we would abide by it and adjust the business of fruit curing, fruit raising, and fruit distribution in California to that finding. That was not what Dr. Wiley wanted; he wanted we should stand with him to discredit the board. And I want to say right now that while I have been in conventions for forty years, or nearly, I have never seen so gross an assault made on gentlemen representing a board of standing, as these gentlemen stood, as was made against them in that congress. Secretary Wilson, with some of his staff, including the solicitor of the department, were present during this conference, and Secretary Wilson said to me, when I had become successful in getting my credentials acknowledged, that he had never seen such gross methods resorted to as he had seen in that congress. This is, of course, a matter of history.

I now come to the point of the present status of the sulphur question. It is in the hands of this Referee Board, but I feel the greatest confidence that the finding of that board and its recommendations to the department will be in favor of sustaining the contention, that the use of sulphur in the curing of fruits is harmless. In the case of benzoate of soda, it was decided by the board that not only the quantity which has been in common use was harmless, but that it was a harmless product in much greater quantity. In other words, it was declared that there was no danger in the use of benzoate of soda in curing of fruit and meat products as now employed, and they recommended that it be continued. Instead of fixing a unit of thirty-five one-thousandths of one per cent of sulphur dioxid, as was fixed under decision 76, I am assured by the members of the Referee Board individually that there is no apparent injurious effect from sulphur dioxid on the human system and that a larger quantity than thirty-five one-thousandths of one per cent will probably be permissible. I am not saying this for publication. I say it on my own responsibility, but to assure the fruit growers of California that they are in pretty safe hands and need give themselves no immediate alarm.

I want to say further that I am given to understand by the Referee Board that whatever their finding may be, it will not be made until about the middle of the year 1910, and if it is adverse to our interests that no hasty action will be taken; that it will not be made operative during the curing and marketing and distribution of the fruit products of this State grown and cured in 1910. Therefore, you have a year before you any way, and if the finding is not altogether to our satisfaction, I feel justified in saying that a unit of sulphur dioxid will be fixed that will enable us to go on as we have done heretofore without danger of interference on the part of the Federal Government.

I presume, Mr. Chairman and ladies and gentlemen, I would act the part of discretion if I stopped here, but I am so impressed with the determination of Dr. Wiley to carry his point, even to the destruction of our interest in California, that I do not hesitate to place myself on record as to what I think should be done with that officer. He is appointed by the President of the United States. He holds his position in the Agricultural Department under this appointment and is answerable really to no one except the National Food Inspection Commission and to the President of the United States. While Honorable James Wilson, the Secretary of Agriculture, is our friend and is ready to do, I believe, anything within reason to protect us and help us, he is powerless to control Dr. Wiley, the chief of the Bureau of Chemistry, or to remove him in the case of his not doing as he desires. Therefore, I say in our own interest, I deem it to be a proper and right thing to create, so far as we can consistently, a sentiment against Dr. Wiley, under the impression that any man as vindictive as he is, as determined to work against us whether right or wrong, should not occupy a Federal position as important as this. The difficulty of his removal is this: No man is all good and no man is all bad. No one is willing to declare that Dr. Wiley is not a chemist, but that he is a pathological chemist I deny. He was educated a physician, but has never practiced medicine a day in his life, so far as I am able to learn; therefore, he can not speak as a pathological chemist, though he can speak unquestionably as a chemist *per se.* It goes, therefore, without saying that Dr. Wiley is useful in some branches of the work which has been assigned to him, and unless we can show that there is real necessity, a public demand from the fruit growers of this State and from other states likewise interested, for the removal of Dr. Wiley, I fear he will remain in his present position and go on fighting without limit, to our detriment. He has it in mind now, and that mind has been made known to me, to again introduce a bill into the different legislatures of the respective states. I have seen a draft of that bill; I know its conditions. I know it was introduced at the congress in Denver in September, but having 47 votes against and 44 in favor, they did not dare make the motion that it be approved by the congress and it fell dead. But that effort is going to be revived just as sure as the sun rises and sets, and the work that has been done will be futile unless we continue like efforts to those of the last two years, to circumvent any action of his in reference to the introduction of these bills. It makes no difference what the federal law may be. We are all in favor of a pure food law. Every intelligent man and woman in California is in favor of a pure food law. But if the different states pass laws of their own, as they have a right to do, and make them so binding that we can not introduce our goods and dispose of them in those states, the federal law will not help us; the state statute will control, so far as the state's distribution is concerned. You may think that I am somewhat persistent. I deny that I am vindictive, but I am so interested in California, I am so interested in the people of California, I am so interested in the industries of California, that it makes no difference who the man is, high or low, when I find he is working against these interests I am against him and persistently so, and therefore I say, whether Dr. Wiley likes me or not, that I am not his friend, I never expect to be. I believe that it would be a wise thing for conventions like this to place themselves on record by resolution, supporting the Referee Board and declaring it to be their intention to stand by the finding of that board, whatever it may be. I thank you. (Applause.)

A recess was here taken until 1.30 o'clock P. M.

AFTERNOON SESSION.

PRESIDENT JEFFREY. The meeting will please come to order. As you know, the excursion should have been this afternoon, but as that has been called off the time is yours. How will you use the two hours here that we have this afternoon?

MR. JUDD. Mr. Chairman, I move that the President, Mr. Jeffrey, arrange the program to suit himself. He is in touch with everything that is coming up, and I believe he is more qualified than any one on the floor to make a program.

The motion of Mr. Judd was seconded and being put by him, was unanimously carried.

PRESIDENT JEFFREY. Mr. Newcomb has something he would like to present.

Mr. Newcomb read a telegram from Santa Rosa extending an invitation to hold the next convention at that place, and spoke in favor of meeting there, as did also Mr. Galloway.

Mr. Costello and Mr. Dargitz made a few remarks on behalf of Lodi, which also extended an invitation to the convention to meet at that place.

MR. NEWCOMB. I would like to say just one more word on this line of fruit growers' conventions, about going to the sections that need us. You have started in on a plan that I think is good, and that is, going to each section and specializing on what they need. This is a general body of the whole State. We can not, at any place, discuss the problems that are just needful for that point. My idea really of this thing would be that the State office hold meetings in these different places, as they have started to do, and then every year this meeting should be held at Sacramento where the State office is and where the insectary is; take the small meetings around and give exactly what those people need, but have the main meeting every year at Sacramento.

PRESIDENT JEFFREY. I will say to the claimants of this meeting, in line with Mr. Newcomb's suggestion, there will be a meeting at Lodi, already provided for. Arrangements are being made for holding a meeting in Sonoma, presumably soon. These meetings that we have held in Solano County and Placer County are larger than our general fruit growers' conventions, though not so general in scope. It may be that Mr. Newcomb's suggestion is good, but Mr. Stephens will tell you that the people of Sacramento don't care very much about having conventions there, Sacramento being a large commercial city, and a very prosperous one; they are so engaged in commercial pursuits they do not encourage the State Fruit Growers' Convention as they should. Of course, we held it there last year and they assisted us all they could. Sacramento is really the place where these conventions ought to be held, and so long as we are going to hold neighborhood meetings anyhow, it will not make so much difference to you. We are going to have one in Santa Rosa and one in Lodi, and they have been promised all over the State in fact, and we will get to them before your next crop comes in. They will be business conventions. We will not consider cultural topics or scientific topics but we will talk business. The Newcastle meeting passed a resolution inviting the next convention to be held there, but as we have had two big meetings there and have to hold still another, it probably would not be wise to have the convention there.

MR. KELLOGG. Newcastle is not pressing that point.

PRESIDENT JEFFREY. The reason these matters are not settled one year in advance by the delegates themselves is that sometimes new matters come up during the year, and it is only a matter of selecting the location. Now, I would like to hear from Mr. Frank Femmons, one of our most honored members, and he would like to say a few words of appreciation to this convention.

MR. FEMMONS. *Mr. Chairman and Fruit Growers of California, Ladies and Gentlemen:* I was disappointed a year ago in not meeting you at Sacramento, and at this late date I have requested of our Chairman, the honorable Commissioner, the privilege of thanking you, the California fruit growers, with Professor Wickson, whom I met personally the other evening, for a resolution that the professor presented before that convention a year ago, and with the sentiments that were expressed at that time, of respect, of loving regard and of appreciation of the life work of Alexander Craw. I come to you to thank you sincerely from the bottom of my heart for that loving kindness that you showed to one of the noblest men that has ever lived in this Western country. For thirty odd years I have known him and loved him as a brother. I was with him in his last days and his last hours, and my own hands and those of a sister were the last hands that arranged some flowers about his cold but peaceful face. And oh, the sadness of that hour! I wish to bring those memories up in your hearts and to renew them in my own, and perhaps I can do no better, as he passed away from us up in the mountains of the Sierras near the Yosemite Valley, than to try, in as few words as I can, to express something of a picture of the last work that Alexander tried to do with his own hands. Perhaps some of his old associates, his old friends that I know he almost worshiped in his very soul, would carry that picture. It was a simple little one and I shall certainly carry it in my own heart as long as I live.

It was Sunday morning, the last Sunday of his life. The June sun was shining bright and pleasant. The birds were singing in the oaks and pines about the grounds. The forest hills were surrounding us, and up above, on the crest of the mountain, the pines and the firs stood against the sky. We were trying to arrange the flowers, do a little pruning here, fixing a little there, though for my own part I was trying to keep him as much as possible from any exertion that I could, but he was all animation, the same old Alexander Craw that many of you have known for thirty years or more. There was no indication of wavering of thought; he was happy, contented and as hopeful as any of you ever saw him in his life. His brother James, who was with us at the time, but who since has also passed away, came and asked us in a joking way if we knew what day it was. I saw that Alexander was confused. He could not change his thoughts for the moment from his pleasures and find some answer to that question. To help him out a little, I asked, "Is it any harm to help God take care of his beautiful things?" "No," says he, and, placing his hand upon my shoulder, "Let's go ahead." Full of life, energy, absorbed right there among the flowers and the roses, he was right in his element and his old self again. But I soon saw that he was getting weary and I led him to a seat on the porch, and he soon lapsed into a kind of a half dreamy melancholy that was such a pain to us. That was the last effort Alexander Craw made to do something with his own hands, and I leave it to you, just an outline as I have tried to paint it, and I thank you for your attention. (Applause.)

PRESIDENT JEFFREY. I think all will recognize how fitting this little tribute to our beloved friend. Away back before any of us, almost, began attending conventions, you will see the name of Alexander Craw in the published reports, always to some effect, always to some benefit for the people of the State, always hopeful for good, and there those records stand for years and years, and now it is certainly befitting for us to make a record of the words of his brother-in-law at this time. We thank Mr. Femmons for this tribute. Mr. Rixford wishes to make an announcement.

MR. RIXFORD. Last spring, in distributing the caprifigs from Loomis, Wells, Fargo & Co. refused to give us the fruit rate. The agent there ruled that as these figs were shipped principally on account of the value of the bugs they were not entitled to the fruit rate. I said, "Are they not fruit?" "Well, yes." But, at any rate, they charged to the central part of the San Joaquin Valley, where most of the figs were shipped, from 70 to 75 cents a box. Taking up the matter recently with the head men in San Francisco, I have finally got them to agree to give us the fruit rate, so that the express charges will be only about one half what they were last season. I thought I had better announce it, because some of you may want those figs.

MR. BRIGGS. I would like to know if I would be out of order in the introduction of a resolution to be incorporated in the report of the Committee on Resolutions.

MR. KELLOGG. Mr. Briggs was requested by the committee to formulate a resolution. It was suggested that he read it to the convention and make his own comments on it.

Mr. Briggs read the following resolution:

Recognizing the great importance of the fruit interest in the development and continual growth of the State, and believing that any material change in present methods for curing and preparing dried fruit for distribution, and further believing in the harmlessness of sulphur as heretofore and now employed in the process of drying fruit, the State Fruit Growers' Convention here assembled in the city of Watsonville—

Resolved, That we commend the action of our late President, Theodore Roosevelt, in taking from the hands of the Department of Agriculture the matter of investigating and determining the wholesomeness of fruit cured by the use of sulphur and of placing the whole matter in the hands of the Referee Board, created by him for determination; and

Resolved, That by these resolutions we express our appreciation of the efforts of Mr. James Wilson, the Secretary of Agriculture, in our behalf, and commend his intelligent consideration of the fruit industry of California; and

Resolved, That we have faith in the wisdom and integrity of the Referee Board, and are satisfied its findings will be fair and right and founded on scientific knowledge and efficient investigation and experiment; and

Resolved, That the attitude of Dr. H. W. Wiley, Chief of the Bureau of Chemistry, in what is known as the sulphur question is in our judgment unwarranted and not consistent with the position he holds as a federal officer, and that we hereby record our disapproval of his course.

On motion of Mr. Judd, duly seconded, the resolution was adopted.

PRESIDENT JEFFREY. Now, I want our Committee on Resolutions to write out a strong endorsement of Mr. Briggs' entire course. My personal feelings are that you can't make these resolutions too strong in favor of what Mr. Briggs has done.

MR. DARGITZ. The committee that was appointed yesterday on the matter of providing for the expenses of printing of these reports on transportation is ready to report. We have heard about the benefits of coöperation in many ways. Sometimes we have an opportunity to demonstrate the practicability of it. We can have very little of the benefit from coöperation except we first have organization. I think we have evidence that the fruit growers of California have all benefited to a great degree from organization, and in order to demonstrate the practicability of that statement I am now going to make this announcement, that the expense of some three or four hundred dollars for the printing of that, I am authorized by a representative of the California Fruit Exchange and a representative of the California Fruit Distributors, to say that the expenses will be prorated between these two organizations in behalf of the growers of the State. (Applause.)

MR. BRIGGS. Mr. Chairman, I desire to express my appreciation of my courteous treatment by the convention, and to say that I regret very much that I must go, but I am a servant of the people of the State and bid to go here and there, and I am going this afternoon to attend a meeting in another county. (Applause.)

MR. KELLOGG. The Committee on Resolutions is ready to make a partial report.

RESOLUTION OF THANKS TO GOVERNOR GILLETT AND LIEUTENANT GOVERNOR PORTER.

Resolved, That this convention does hereby express its heartfelt appreciation for the presence and inspiration received from Governor James N. Gillett and Lieutenant Governor Warren Porter at the opening sessions. We thank them for their manifest interest and words of encouragement.

RESOLUTION APPROVING HORTICULTURAL COMMISSION.

Resolved, That we heartily approve of the administration of J. W. Jeffrey and his efficient secretary, O. E. Bremner, of our State Horticultural Commission, and commend the wisdom displayed in holding conventions of growers and shippers in important fruit districts over the State; harmonizing the different interests; standardizing the packing and marking of the fruit for interstate shipments; and setting in force methods for the extermination of fruit pests; and recommend that similar methods be pursued until our fruit industry has attained the high position to which it is entitled.

PRESIDENT JEFFREY. I thank you. I would like to say one word in regard to that resolution. These meetings will be held in accordance with the spirit of that resolution to the fullest extent of the power and strength of the office. We have promised one in El Dorado County, and, as I said this morning, two or three other places, and one in San Bernardino County and another in Porterville and another in Kings County, and we will hold all that we can through the winter and spring and as far as the money and the strength of the office will go. We have various other duties, but we expect to keep these up, and I thank you for the appreciation.

RESOLUTION REGARDING KEEPING RECORDS.

Whereas, It is quite evident that in future our orchards must be bred up to produce fancy fruit and to do this we must get rid of scrub trees; therefore, be it

Resolved, That we each begin keeping a record of the production as to quality and quantity of fruit, behavior of tree, time of blooming and ripening of fruit, on any tree in our orchards that seems exceptionally valuable; and after five years' proving of continuous value and fixed qualities, these trees and records be offered to nurserymen for propagation as pedigreed fruit; and be it further

Resolved, That we encourage our nurseries to propagate only the best and most vigorous stock by refusing to buy "seconds" or inferior stock at any price.

RESOLUTION REGARDING STANDARDIZATION.

Resolved, That the fruit industry of California has reached a point which demands a standardizing of all deciduous fruit packs, prepared for interstate shipments Placer, Solano, and possibly other counties have or will adopt standards for their districts, which we heartily commend. We recommend that all sections of the State unite, so far as practicable, in having the standard of the varieties of fruit uniform, the markings designating the quality the same, and that all fruit shipped be packed in standard dimension boxes only.

RESOLUTION ON OVERPRODUCTION OF FRUIT.

Whereas, Several varieties of fruits and grapes seem to be near or actually suffering from overproduction or underconsumption; and

Whereas, The great and growing demand for the Smyrna figs is so far ahead of the supply and the product so excellent; and

Whereas, The profitable areas for almond production are so limited and the demand so great and not likely ever to be exceeded; therefore, be it

Resolved, That we earnestly recommend the planting and propagation of these two excellent fruits, also Bartlett pears, wherever the conditions are suitable and they have been proven out.

PRESIDENT JEFFREY. Would the committee have any objection to putting Bartlett pears in there? There is one county in the Sacramento Valley where they are trying to eradicate the pear blight so they can begin planting again.

MR. KELLOGG. We have no objection to including that.

PRESIDENT JEFFREY. One of these meetings which you recommend was held in Sutter County, and they took this matter up and discussed it thoroughly, the fact that they were trying to eliminate the pear blight in that entire county and give the orchardists a chance to plant Bartlett pears, and by passing these resolutions, especially when there isn't a nurseryman on this committee, it is really a beneficial act for this convention to express its ideas on what particular lines of fruit culture should be extended and what should be curtailed.

MR. JUDD. I move the adoption of the resolution as amended.

The motion was duly seconded.

MR. STEPHENS. I, for one, am opposed to the resolution. I am opposed to it from a conscientious standpoint, because we don't know what the outcome of the planting of these varieties will be. Ninety-five per cent of the literature sent out to induce people to come here recommends the planting of certain varieties and there is no one particular variety that has been recommended more strongly than Tokay grapes—peaches and everything you can think of. I, for one, don't propose to take the responsibility to say to any person here or any person in the State, set out Smyrna figs, almonds, pears or anything else, simply because we do not know and we can not look into the future far enough to know what result would come from such recommendation. It might be an inducement for thousands of acres to be set out, not only upon land that would produce those things as they should be and as nature requires, but also upon land that would not be adapted to their growth and their production. Not being able to go out and test the land, the man who would invest his means in there would go upon our recommendation, and he might be the sufferer to a great degree, from a financial standpoint, and possibly his all, from that standpoint. And I do not believe that it is within the province of this convention, I do not believe that we should undertake to advise any man what to do in regard to the varieties of deciduous or other fruits that he should set out. We have had an example, and there are thousands of growers that are absent to-day for the reason that they believe that they can not afford the expense of attending this convention, that are upon the very verge of ruin because they have followed the advice given in such matters as this. It is well to incorporate in the report, if you will, the papers that have been read here and let the man judge for himself, but don't recommend to him what he shall do in regard to these matters. (Applause.)

MR. WALTON. I indorse Mr. Stephens' remarks from a different standpoint, and that is, that it is not within the province of this convention to give any advice as to what variety of fruit shall be planted in this State. I think when you come to look at it you will see the injustice of it.

MR. HARTRANFT. Mr. Chairman, I was going to indorse exactly what Mr. Stephens said in exactly the same way Mr. Walton has placed it, because I rather felt amazed that the convention should undertake to give advice as to what particular varieties to plant. We have had contests in this convention before regarding advice, pertaining to the planting and other subjects pertaining to the coming of homeseekers which have always been candidly considered and, I think, wisely acted upon, and upon the ground that I should recommend probably later, in other discussions that Mr. Stephens has alluded to, that the convention do not go on record in that particular tone of voice. I don't think we should be either for or against the planting of any particular thing. The records stand. There are those that are self-interested and those that are disinterested, and the man then has his welfare in his own hand, both as to what to plant and what not to plant, and I should be opposed, and always have been and always will be, for the convention to say either for or against any particular thing of that kind.

PRESIDENT JEFFREY. I would like to make one suggestion here as your Chairman. A man has no right to plant any more Tokay grapes under present marketing conditions. A man has no right to do a thing that would injure his neighbor. Now look at it from two standpoints. He has the legal right to do it, and he has been exercising that right with a vengeance. By simply naming the varieties of fruits that this convention thinks ought to be extended, by inference limits the varieties we think should not be planted. I hold that these land schemers in the Sacramento Valley threaten to wreck the fruit business itself, because if there are 10,000 car loads of Tokay grapes going into the markets, it is going to demoralize the market for your peaches and pears, and I claim it is a matter of self-protection for the growers of this convention to speak out on such matters. You are up against a crisis, and men are becoming bankrupt all over the State from listening to the song of the siren, the land boomer. The sheriff is fixing a whole lot of them up there every year, and there will be more of them that have listened to the song of the land seller that has land to sell planted out to grapevines to give it an apparent value as a venture, and the very planting of the grapes has really deteriorated the value of the land. They are trying to shut some of the land boomers in the Sacramento Valley out of the mails by getting a fraud order against them.

MR. HARTRANFT. I have just read this report for the first time. I am happy to report that for once I agree with Mr. Stephens. I move that we consider the two together, and if we take the negative take also the positive.

MR. ASHLEY. I second that motion. I think that quite a number of us would be much better off if this convention had taken up this matter a year or two years ago and put out some information that people could rely upon as to the standing of the Tokay grape, and also as to what the prospects are for fruit that will pay.

MR. STEPHENS. I am in hopes that the suggestion offered by Mr. Hartranft will not be accepted, and I really hope that the gentleman will withdraw the suggestion, because I can see that there will be no other business transacted by this convention this afternoon and perhaps not to-morrow. It is a question of great magnitude and we could not possibly get through with it. Therefore, I think we had better get along just as peaceably as possible until we come to the rock upon which we will probably divide. I think we had better take one question up at a time and consider it. The reason I objected to that is, I don't want to suggest to any man what to do. For many years I have been solicited to make suggestions. My answer has been that I have got no advice to give for the reason that I do not know myself what varieties to put out. I have uprooted trees and had to fill in the vacancies; I didn't know what to do, and in a manner I was groping around in the dark. I would one year put out one variety, switch the next year and put out another, and for five or six years kept on changing every year.

MR. DARGITZ. I am very glad indeed to see the discussion and the interest taken. If we pass a resolution without any discussion the possibility is we will proceed to go home and forget all about it. The idea of the resolution is not to say that any man shall or shall not plant any variety. The question comes to me very forcibly, because some years ago I was looking over the State with a view of selecting a location for fruit growing. It is not so much a question of what we are going to do, but other people are coming to the State with a view of going into fruit growing, and I understand that all these papers that have been read here and these resolutions will be printed and will be placed in the hands of homeseekers who are contemplating going into the fruit business or planting ventures. If we who are here and have experience know that certain varieties of fruits have been planted to such an extent that there is absolutely no profit in them to-day, will we be doing ourselves justice, will we be doing those who contemplate coming in justice, if we keep our mouths shut and let them plant things that are unprofitable even now? It is not a question of changing market, it is not a question of shifting from one fruit to another, as, for instance, peaches and plums. If the market was low on peaches to-day and high on plums we would not suggest that you grub out your peaches and plant plums, for the reason that to-morrow it may be the other way. But knowing that somebody is going to plant anyway—if they did not the nurseries would get in trouble—knowing that there is a very great and increasing demand for the Smyrna fig and at such prices that it is profitable and that it is liable to continue to be profitable for a good many years to come—I will grant that there may be such a thing as overproduction of the Smyrna fig at some time, because there are large areas in the State that are liable to grow it in paying quantities, but for the present the outlook is very good along that line. On the other hand, the question of almond planting. Is it a selfish proposition for me to recommend the planting of almonds if it is likely to overdo the market? My principal article is almonds, and when I invite you to produce more of them if that results in overproduction, I am inviting trouble for myself, but I think I showed conclusively by my paper yesterday that there is no likelihood in generations to come of overdoing the almond question, if we plant where the varieties have been proven out. The late Senator Langford owned a very large acreage of almond which never paid, and the orchard that I now have. He always referred to the Texas Prolific almond as a mustang, and he called these paper shells thoroughbreds, and the thoroughbreds didn't pay and the mustangs did, and about a year before he died he remarked that if his orchards had only originally been planted to mustangs he would have been a wealthy man.

The question was put by the President on the adoption of the resolution as reported by the committee, and the motion to adopt prevailed.

RESOLUTION COMMENDING PRECOOLING.

Resolved, That all experiments and observations have demonstrated the great importance and substantial benefits of cooling fruit as quickly as possible after it has been picked to arrest decay and preserve the same in a sound and healthy condition. Therefore, this thirty-sixth California Fruit Growers' Convention commend any method that will do this work quickly, thoroughly, and uniformly to the center of the fruit, and believe that best results will be obtained by the method of preserving fruits at initial shipping points, and whenever possible before the fruit is loaded in the car.

RESOLUTION REQUESTING SUPERVISORS TO ACT.

Whereas, Many noxious weeds are appearing as a menace to both orchardists and agriculturists; and

Whereas, Under the present horticultural law the county horticultural commissioner is given the authority to exterminate noxious soil pests as well as fruit pests; therefore, be it

Resolved, That we urgently request the board of supervisors in all counties to speedily establish the commission in their counties, and insist on the extermination of such pests.

PRESIDENT JEFFREY. This is a State-wide question, gentlemen. Mr. Chase, will you speak just one minute on that point?

MR. CHASE. There are so many noxious weeds in the State, in Sacramento County, in Placer County—indeed, all over the State—and I have written letters and I know from the best authority on one particular weed that it is easier to tell where it is not than where it is.

PRESIDENT JEFFREY. Has there been any land abandoned?

MR. CHASE. Yes; there are orchards abandoned in Sacramento County and Placer County and out on the Cosumnes River. There are acres of land for sale. We can't raise a thing. This Johnson grass can be eradicated, without great expense, in three years by the methods adopted by the Bureau of Plant Industry at Washington. There is another noxious weed I find that is producing a great deal of alarm, and that is one of the lippias, not the *Lippia repans*, where it has been used as a sod to make an overflow. It has got all over the Cosumnes River, where the dairy business is the chief business. It is destroying the alfalfa.

PRESIDENT JEFFREY. And you think this is a great question?

MR. CHASE. It is one of the most important questions there is.

MR. KELLOGG. I want to say this, that it was an eye opener when you stated to me yesterday that the Horticultural Commissioner had power over that. For years I have made a practice of sending men clear to town to clear the noxious weeds, but my neighbor would have a fine patch of them.

On motion, the resolution was adopted.

RESOLUTION APPROVING WORK OF STATE UNIVERSITY.

Resolved, That we appreciate the work of the State in expert and efficient experiments and effort undertaken by the University of California, and the valuable demonstrations of knowledge and results attained by their efforts.

RESOLUTION RELATING TO GOOD ROADS.

Resolved, That the fruit interests of the State are greatly affected by the condition of the public highways; every jolt is a menace to its keeping qualities. Our fruit trees and vines are unjustly taxed in addition to the taxes upon the land, a discrimination in favor of all other agricultural pursuits, except the alfalfa growers. We, therefore, feel that it is our special right to demand the best roads possible in all of the horticultural districts.

RESOLUTION AS TO PERSONS SELLING LAND.

Whereas, Unscrupulous and sometimes dishonest persons are throughout the State buying cheap and sometimes worthless lands, cutting the same into small tracts, often so small as to be worthless for the purposes of maintaining a family or any part of one; and

Whereas, Said parties often advertise the same in a laudatory and often false manner, creating impressions that often mislead the unwary; and

Whereas, The Government is engaged in making a soil survey throughout the State for the purpose of defining the character of the soils so surveyed to guide the agriculturist in making the best use of said lands; therefore, be it

Resolved, First: That the fruit growers of the State Convention assembled deprecate the methods often used by the aforesaid parties, and condemn as false many statements made setting forth the possibilities on such lands.

Second: That we ask the Government to publish the soil surveys together with the analysis in bulletin form, so that buyers may fully understand the soils of the intended purchase.

Third: That the legislature be asked to pass such acts as will protect the buyer by compelling the seller to publish the soil analysis and character of the same in accordance with the Government survey.

Fourth: That we here and now call the attention of intending settlers to the fact that our soils and location should be very carefully scrutinized before buying or planting, especially as there are plenty of locations available that are worthy.

MR. CHASE. I want to say just one word on that. That is one of the most important resolutions we have. In my recent investigations in regard to raising oranges and other things and our experience in Fair Oaks, we have planted our trees where they will do no good. Just now there are about to be planted 2,000 acres of land and the owners are going to advertise it as orange land. I have suggested whether some one should not go and ascertain whether that land will grow oranges. The question I wanted to ask was, can that be done at the expense of a county or can the State order that done?

PRESIDENT JEFFREY. No, sir.

MR. CHASE. The State has appropriated $16,000 for the examination of diseases, and I did not know but that they might be allowed to examine land that is going to produce diseases.

PRESIDENT JEFFREY. The disease is in the mind of the Eastern gullible buyer and we can't cure him until he comes out.

MR. CHASE. We have suffered a good deal from planting trees on soil that is not fit for them.

MR. HARTRANFT. I am only sorry for that report in one respect, the indefiniteness of the persons referred to. This condition has existed in California ever since about 1870. Land has been bought and subdivided and the old settler has said it was worthless. Mr. Stephens convinced me five years ago that the State was going to rack and ruin, and I went down home and started a homeseeker's journal. I let some fellows get hold of me and I have been subdividing. I have put out seven large tracts of land. We have our record behind us. I get not less than three hundred letters a month asking if this concern is right, and I have come near going to jail for libel. It would take almost a supreme being to decide what colonies are thoroughly legitimate. I feel that if this convention wants to have a committee pass on the colonization plans of the State it would be one of the best things that could happen, especially with regard to this planting eucalyptus. The Sacramento Valley Development Company has had no reputable newspaper in California carry their advertising, either on the Tokey proposition or the eucalyptus. I think something definite should be said there. I know you have one paragraph, but taken in connection with the Associated Press dispatches, I don't think the convention has stated it in an intelligent manner. The people have got to be brought here. We have got the valleys in this State that are going to be settled either by Japs or Chinamen or Slavonians or Americans, and while all races are fellow beings we want Americans, and it is a great work, a sacred work, and I think the paragraph, together with the general attitude, just makes us carping critics about what I deem to be the noblest profession next to growing fruits, and I do think that that resolution is a very sweeping proposition, has no allusion to the legitimate work in that line which has been going on and always has got to go on, and I am going to work against it, although I am not a bit opposed to its general tone.

MR. DORE. I am not pleased with the resolution as read. It indicates that the report of these soil experts when published shall be a guide for newcomers. There is hardly a section of land, perhaps hardly 80 acres, that would bear any resemblance throughout the entire tract where the survey was taken. In my own place of 100 acres there are all sorts of soil and many kinds of hardpan within reasonable distance. To take a sample and sell a farm on that sample would not pan out, and I believe the same situation prevails throughout the State. There are tracts in the Sacramento Valley and Kings County where it might average, but generally it will not.

MR. STEPHENS. I heartily endorse what Mr. Dore has said. There are many localities where you go 50 feet and you find altogether a different character of land, and you will find in many instances seven or eight different kinds of soil on a hundred acres, and unless the expert bores into the ground on almost every 50 feet you can't tell what it is, except it be an alluvial deposit, like a river bottom, and in many instances the value of the land for productive purposes varies materially in a short distance. I think the resolutions are all right. We don't want to deal in personalities, but it will be a warning in general. It will have a tendency to put people on the lookout and that they themselves should be the investigators to ascertain whether this or that piece of land offered for sale is worth the price asked. I don't believe, under the circumstances, in citing any particular interest, any particular locality or any particular colonization organization, because, as Mr. Dore says, the lands vary so materially in such a short space. Take the hardpan. It may be within eight inches of the surface here and 50 feet away it may be within ten feet of the surface.

MR. HARTRANFT. I would like that we vote that resolution down and then vote that our Chairman appoint a committee of three or seven men who will bear the brunt of making the good name of California, who will investigate the general publicity schemes that are going on about lands and have in their power to call a meeting, and directing the attention of the postal authorities, without taking the dangers and risk of direct publicity. That will be work.

MR. JUDD. The Government of the United States has agents all over the State of California, and I presume other states, making these soil surveys. In the Pajaro Valley and the surrounding country I think Mr. Mackey worked something like two seasons making those surveys.

The Board of Trade of this town went to quite a bit of expense in having those surveys put in vials or long glass tubes, setting forth the various localities, what it is composed of, where it was taken from and what its value was. It seems to me that as little as this convention could do would be to hold up the hands of the Government in this very thing that we propose in this resolution. If we want to show the people what we have got and we are honest about it, there is nobody going to make any objections. But if you have got any hardpan down west of Fresno, 12 or 14 miles, all covered with alkali, and sell that to people back East until taxes carry them out, that is all right. If you go up near Centerville and find it is a bog during the wet season, you don't want to get a lot of people in there. It would turn out just exactly as Mr. Hoffman's colony did at Merced. We have a man in our county now, a lawyer, that spent something like $35,000 or $40,000 on his own place before he got there. There was something like two hundred families from Holland that sent their money on and had their houses built and they came out here and they got the water on, and the third year they had to pull up every tree; and lots of those people, all they had on earth was sunk in that hardpan spot; and I only know of one man, Mr. A. R. Curry, they crowded him off on to a sandy spot and he put it out to olives and has made good. There isn't anything in the State of California that damages us to day as much as this grafting proposition on poor land. I am in favor of the resolution as read.

The motion to adopt the resolution was carried.

Resolution Regarding Parcels Post.

Whereas, The California Fruit Growers' Convention has been working for five years to secure for American citizens the advantages of modern civilization in the way of a parcels post; therefore, be it

Resolved, That this convention appoint Edward Berwick of Monterey, John S. Dore of Fresno, and G. B. Messenger of Los Angeles, a committee and authorize these to compile from the Congressional Record the action of every senator and representative from California, upon any phase of the parcels post which may come before Congress, and supply the same to the press of the State.

Resolution as to Committee on Parcels Post.

Whereas, The future prosperity and very existence of California horticulture depends on transportation facilities; and

Whereas, One most valuable transportation agency, the parcels post, which in other lands brings producer and consumer together, is here, by reason of prohibitive rates rendered useless; be it

Resolved, That this convention of California horticulturists assembled at Watsonville this 8th day of December, 1909, hereby requests the senators and congressmen who represent the Pacific coast states at Washington, to pass such measures as shall permit the Postmaster General to grant the American people such parcels post rates as are current in Germany, Great Britain, Japan, and other civilized lands;

Resolved, further, That our Secretary be instructed to send copies of these resolutions to our representatives in congress and also to President Taft and Postmaster General Hitchcock.

Resolution as to Postal Savings Banks.

Whereas, Our monetary system is inadequate to put into general circulation sufficient to meet emergencies arising from the movement of crops, or money stringency caused by financial institutions that have practical control of issue;

Whereas, Other progressive countries have found the system of postal savings banks to cover many of our financial ills; therefore, be it

Resolved, That we, the Fruit Growers' Convention assembled, most earnestly urge congress to pass such laws that will bring about such postal savings banks.

Resolution Endorsing Report on Freight.

Resolved, That the able and exhaustive report of our Committee on Freight Rates shows valuable data and a vast amount of labor performed, we hereby endorse that portion of their claim for a reduction of a freight rate bringing deciduous fruits on a par with the orange rate. We justify their demand for a postage stamp rate of $1.15 per hundred pounds, but later experience and computations with present labor conditions shows us that a rate of $1.15 for the past season would have been too high to encourage any further development in the fruit industry. Therefore, we hereby instruct our Committee on Freight Rates to press the matter through all legitimate channels for a postage stamp rate of $1, thus placing all deciduous fruits on a par with the lemon and apple growers of the coast. This rate only will satisfy the fruit interests and offer encouragement to prospective growers.

MR. STEPHENS. I wish to return the thanks of the Freight Rate Committee to the delegates to this convention for their kindness in endorsing the action of their committee. I will state that for years we have been engaged in our efforts to secure the reduction which will be in your interest and we have not spared either time or expense. Labor has not entered into it in any way. We have, as you see, conducted the correspondence in a manner that has been kept from the public up to this time. We believed, as I stated yesterday, that the reasons were so obvious why the same rate should be given the deciduous fruit shippers that for years have been given the orange shippers, that we would have but little if any trouble in securing that, but we found that we would have trouble. We kept it from the press, we kept it from everybody that would give it publicity, in the hope that at this time or before this time we would receive information from the transportation companies that their request had been granted, and had that request been granted that report would not have been published. In behalf of our committee I thank you, Mr. Chairman, and the delegates, very sincerely.

A recess was here taken until 8 o'clock P. M.

EVENING SESSION.

PRESIDENT JEFFREY. The meeting will please come to order. The first number this evening is "Insect Pests as they relate to Rural Hygiene, with special Reference to Control," by Professor W. B. Herms of Berkeley. (Applause.)

PROFESSOR HERMS. *Mr. Chairman, Members of the Convention, Ladies and Gentlemen:* The topic that I have selected for this evening's talk is slightly different from that indicated on the program. I have omitted one word. Instead of speaking of it as "Insect pests" I want to refer to the subject as "Insects," omitting the word "pests."

INSECTS AS THEY RELATE TO RURAL HYGIENE, WITH SPECIAL REFERENCE TO CONTROL.

By PROF. WILLIAM B. HERMS, University of California.

On first thought there seems to be little relationship between insects and disease, but a little observation will at once reveal much that is good and much that is bad about these tiny winged creatures. A great educational campaign is sweeping over the entire world at the present time which has as its aim the hygienic betterment of the human race, pointing out certain dangers to health and happiness which lie on every side. There is, however, room for criticism, inasmuch as the methods used tend largely to frighten people without pointing out the methods applicable in the correction of the evil. Fear is at the root of much disease, and is disastrous. Boldness and daring, however, in the face of danger may also lead to disaster. It is, nevertheless, notoriously true that we as a nation in our hurry to make a living have to be warned over and again of lurking danger; we go heedlessly on until we are frightened into action. Can we not calmly consider these questions of hygiene in the light of preventive medicine, acting wisely and quickly, not hastily gaining time and averting disease in the end? Our nation is a business people and business propositions appeal to us. If it were told you that it is possible to save ten millions of dollars annually, you would be ready to figure at once. Yet the American people spend annually more than twelve millions of dollars for fly screens, fly paper, fly poisons, and the like, not even to mention the great loss of life estimated in the hundreds of millions of dollars lost through preventable diseases in which insects play the most important rôle, as in typhoid fever and other enteric diseases, malaria, and yellow fever. Added to this great loss are the still further millions due to insects as they relate to the stock raiser in Texas fever, anthrax, warbles and the like. If there were time to add another phase to this direct loss it would be instructive at least to point out the tremendous loss to man as he is impaired in vigor through malaria, a loss to himself and family as a producer. Then, too, the depreciation of real estate value through the prevalence of malaria, yellow fever and the like, is an item of no small import.

When it is considered that we are here dealing with matters which are largely if not entirely preventable, is it not worth our while to consider somewhat more specifically the relation of the insect to rural hygiene, and determine as far as possible in a brief way a few methods of control?

INSECTS AS SCAVENGERS.

Nature has provided no better scavengers than the flesh flies which devour through their larvæ literally tons of dead animals every season. The vile smell emanating from one dead rat or from one dead fish can better be experienced than described, but imagine the pollution of the air that would exist if the masses of dead animals left to die without burial were not reduced through the agency of the flesh fly larvæ. In a study of the conditions existing along the shores of the Great Lakes the writer made observations for five summers on the relation of the insect scavengers to the beach débris. For a distance of one mile as many as 538 dead fish (mostly small) were cast up during one night by a high surf, the weight of these fish was 20.38 kilograms (about 45 pounds). This was about an average mile, and thus dead fish were strewn for many miles, and this casting up of bodies was regularly repeated at short intervals. A walk along this same beach about three days after a storm demonstrated most satisfactorily the effective work of the flesh flies, since the dead fish and other animal bodies were reduced to mere shells which were comparatively odorless. In weight the individual fly increases from 0.2 mg. at birth to an average of 90.2 mg., or an increase of 45 one-hundredths per cent of the original weight. Since this applies also to the reduction of animal matter in general, these few statistics are given to demonstrate the efficiency of this particular group of scavengers. What is true of the two or three species of flies just referred to, namely, the green bottle fly (*Lucilia cæsar*) and the large gray flesh fly (*Sarcophaga sarraceniæ*), is only true of certain other scavenger flies with very important reservations. The two flies mentioned are typical insects of the great out-of-doors, rarely coming into the house as does the blowfly (*Calliphora vomitoria*), and therefore rarely attacking the prepared foods of man. We have now pointed out the qualities of a good natural scavenger, namely, it must do its work effectively and it must not enter the dwellings of man to attack his foods prepared for use. Certainly, this does not apply to the common house fly.

The annihilation of a species whether complete or relative always brings opposition. Few ideas are more firmly rooted in the mind of the average man or woman than that Nature has brought forth nothing that is useless in the economy of the human family—it must be good for something, otherwise it would not be in existence and should therefore not be exterminated nor even molested. True it is that we must study Nature's ways and endeavor to find out what she is trying to do, then help her to carry out her plans more quickly and more accurately. For instance, if Nature has provided scavengers, she is endeavoring to clean up, thus pointing out to man what *he* should do. The house fly is often spoken of as one of Nature's scavengers. By a careful study of the performance of this function by the fly, it can be said without question that the house fly is a poor scavenger and it certainly does not stay out-of-doors. The house fly breeds primarily in excrementitious matter, and this of all offal from animals and man is the most dangerous source of infection. Thus all evidence is against the house fly, and certainly no one would suggest that the house fly be left unmolested, because it helps man to keep his premises clean (which it does not), and that which the fly might be liable to reduce a little should not be permitted to accumulate exposedly on the basis of ordinary rules of sanitation.

THE HOUSE FLY AS A CARRIER OF DISEASE.

It may be said without hesitation that the house fly is one of the most dangerous animals, the greatest menace to human health. It is so, largely because it is generally regarded as an innocent creature, and because the labeled disease in large parcels is not observed, of course, there is no evidence. There is more first class experimental evidence against the fly to-day than there is against any other insect, except the mosquito. The fly is dangerous because of its vile breeding and feeding habits, during which time it may become loaded with disease producing organisms. The mouthparts and feet are perfect collectors of filth. Each one of the six feet is equally fitted with bristles and hairy pads which secrete a sticky material, adding thus to their collecting powers. The diseases which it is possible for the house fly to transmit and which have been proven against it are typhoid fever, dysentery, summer diarrhea in infants, cholera, tuberculosis, hospital gangrene, and several other disease for which the evidence is as yet meager. Now the causative organisms ("germs") of the above mentioned diseases are found in the excrement, vomit, sputum, and pus, all of which form articles of diet for the fly, and the mode of infection is by way of human food (wounds in the latter case) which are contaminated, or infection of wounds and cuts in gangrene. Time alone prevents us from dwelling on the details of infection.

From 75 to 125 eggs are deposited in one mass, and there are usually several (2 to 4) such layings. The eggs hatch in from twelve to twenty-four hours, and the newly hatched larvæ begin feeding at once. To gain an estimate of the number of larvæ developing in an average horse manure pile five samples were taken from various parts of the pile and the larvæ counted, the weight of the samples being previously taken. The total weight of the samples was fifteen pounds and the total number of larvæ (maggots) was 10,282, all of which were quite or nearly full grown. This gives an average of 685 larvæ per pound, and the entire pile was estimated at not less than 1,000 pounds, of which certainly two thirds was infested like the samples. A little arithmetic gives us the astonishing estimate of 455,525 maggots in an average manure pile of only four days' standing. This particular manure pile (not from a livery stable, either) was only one of many known to exist in various parts of the city. No wonder flies fairly swarm in the vicinity of these choice ornaments!

The growing or larval stage requires from four to six days, after which the maggots often crawl away from their breeding place, many of them burrowing into the loose ground just underneath the manure pile, or crawling under boards or stones, or into dry manure collected under platforms and the like. The maggots often pass three or four days in this condition before they change into pupæ (the resting stage), recognized as small chestnut colored barrel-shaped objects in which the maggots transform to the winged fly. This resting stage requires from five to ten days and more, varying according to temperature; thus the time necessary for a fly to develop from an egg to the winged insect, as we know it, is usually from twelve to fourteen days in midsummer.

We are now familiar with the facts of development and habit and have this knowledge as a basis for action against the pestiferous and dangerous fly.

ESSENTIALS OF HOUSE FLY CONTROL.

Methods of control are planned along the lines suggested by the study of the life history and habits of the insect. The more familiar we are with these two factors, the better able are we to attack the problems of control. Usually the most vulnerable stage in the life history is selected at which time the insecticide may act most speedily, or during which time permanent preventive measures are most effectively applied. Certainly wherever the breeding places can be eliminated, this method should be followed. It has been already pointed out that at least ninety-five per cent of our city house flies have their origin in the open horse manure pile, and that the remainder are bred in the open garbage can and similar situations. The point of attack is clearly shown. *The open manure pile must be abolished and stables must be kept clean.* Receptacles containing kitchen refuse must be kept tightly closed or screened and refuse of any kind must not be thrown out into the backyard to decay. The reason for this cleanliness in human habits is to prevent the female house fly from depositing her eggs upon the material which is to provide food for the maggots.

Permanent preventive measures will always be far less expensive in the end, and also very much more effective than the application of temporary methods in the form of insecticides, which must be applied over and over again with continuous expenditure of time, labor, and money.

MANURE BINS AND PITS.

There must necessarily be some way of disposing of manure from stables, but the old method of merely throwing this material outside the barn door and allowing it to accumulate there for months at a time is not only disgusting, but is a menace to health. The open manure pile must be abolished. The effectiveness of fly-tight (*not air-tight*) manure receptacles has been demonstrated beyond question; it only remains to be decided as to what form is most practical and carries with it the least expenditure of time and money in construction and best results for a given case. A closet or bin can be constructed at a small cost, which is satisfactorily offset by the absence of the fly nuisance. Such a closet may be built in one corner of the stable with a small screened door, through which the manure is thrown when cleaning the stables (providing also for ventilation), and an outer door giving access to clean out the closet once or twice a week, or a closet of about the same construction may be built in the form of a shed or lean-to connecting with the stable by means of a small screened door as above. In all of these cases the manure must be emptied at short intervals and should then be scattered on the field. Objection is here raised by such who wish to use rotted manure for fertilizer. I believe the best plan, then, is to construct a pit in the ground into which the manure is thrown. The pit should be deep enough so that the manure will remain far enough beneath the level of the ground to cover the pit securely with a fly-tight roof. Frequent and heavy liming will aid greatly in attaining the object desired.

INSECTICIDES FOR MANURE HEAPS.

The purchase of insecticides for continuous use on the manure pile would be a matter of no small cost, especially because of the tenacity of life shown by fly larvæ and the consequent strength of insecticides necessary to kill them. The cheapest, and at the same time effective, preparations now available must be applied in strength two to five times that which is useful against other insects, and furthermore, the larvæ can not be easily reached buried as they are in the bedding and offal. Chemicals used to destroy the larvæ (maggots) in the manure pile may be roughly divided into two classes (1) contact poisons, and (2) stomach poisons. To the first class belong such preparations as the kerosenes (generally used in the form of emulsions) and the cresol preparations, also chloride of lime. To the second class belong the arsenicals represented by arsenate of lead and Paris green. All of these insecticides are more or less effective when used in proper concentrations and in sufficient quantities, but none of them can be applied with any degree of safety to man or the domesticated animals, because of either their inflammable, poisonous or corrosive nature. We are, consequently, again forced to recognize the utility of fly-tight receptacles for the manures. While the experiments with tobacco decoctions applied to the manure pile have not proven successful, the use of tobacco dust liberally intermixed seems to offer better results.

CLEANLINESS ABOUT STABLES.

The writer has been called in on frequent occasions to explain the presence of many flies about stables which were said to be in "perfect condition." Three instances may be mentioned. In one case the inside of the stable was in good condition, the manure being thrown out in a heap and removed every four or five days. It was said that surely no flies could develop under such conditions, inasmuch as it required ten to twelve days to become full fledged flies. The error is evident at once, namely, it requires only four or five days for the maggots to reach their full growth, after which many of them migrate from the manure pile proper into the loose ground underneath or into near-by débris. Removing the manure pile every four or five days, therefore, did not eliminate the trouble; indeed, it was shown that hundreds of maggots were present in pockets under the site of the pile, and furthermore 2,561 pupæ were taken with one and three fourths pounds of manure collected at random from underneath a platform leading from the stable. Thus there remained no further question as to the source of the flies in that locality. The second instance seemed to have a better basis for doubt. In this case the stable was provided with a cement floor with good drainage and the manure was thrown every morning directly into a cart and immediately hauled away. Now, where did the swarm of flies come from? Adjoining the stable there was a very small lot in which the horse was frequently set free. No attention, of course, was paid this open lot, and manure collected there which was kept fairly moist with urine and here literally thousands of house fly maggots were developing. Again the problem was solved, the horse lot was thoroughly scraped and thereafter kept clean. The third instance was easily explained in part, and eventually entirely elucidated. In this case it was a certified dairy. Flies were abundant; where did they come from? The horse stables were found to be partly floored with cement, but the stalls were made of wood planks with wide crevices between. In these crevices manure had collected abundantly and maggots were found there in large numbers. But that was not altogether sufficient to explain the situation. It is, of course, well known that cow manures, unless accumulated to retain moisture, are not favorable breeding places for house fly maggots and none were found. But there is no excuse for not properly disposing of cow manures, inasmuch as the horn fly develops here, one of the most troublesome cattle pests. Further search, however, brought to light the fact that the cattle were being fed at that time on "brewers' grain" much of which remained unconsumed and was "dumped" upon the field as waste. These piles of waste "brewers' grain" were found to be literally alive with fly larvæ, and again the mystery was solved. These three instances will suffice to make clear the range of breeding places to a large extent and also the necessity for careful inspection of premises.

THE FLY IN THE HOUSE.

Nearly all efforts thus far to destroy the fly have been directed toward the winged insect, to either destroy it in the house or drive it away. These are certainly laudable efforts, but will only afford in all cases temporary relief. The fly continues to breed, and one fertilized female can be the progenitor of countless thousands of flies in one season.

Until the permanent methods of control come generally into use the utmost care should be exercised to keep this most dangerous of disease carriers out of the house. Thus properly screening both windows and doors is important. Grocery stores, fruit stands, candy shops and butcher shops, bakeries and restaurants, which do not protect their wares from the flies, should be compelled to do so by health authorities and patrons should insist upon this precaution. A little public sentiment in this direction will work wonders.

The use of the ordinary fly poisons is objectionable, since poisoned flies are liable to fall into prepared foods and cause mischief to the consumer. Furthermore, not a summer passes without its toll of innocent children whose lives have been lost, generally in extreme agony, by drinking some deadly fly poison. The writer has found (as already suggested by others) that formaldehyde, properly used, forms a very good substitute for arsenical or cobalt poisons. This liquid material is rather inexpensive when used as indicated and has the added advantage that it is not poisonous to man, and may, therefore, be used with impunity around food; it is also one of the most powerful germicides known and is not injurious to delicate fabrics. Formaldehyde, as purchased at the drug store, is in about a 40 per cent solution and should be diluted with water down to 5 per cent to 8 per cent; in other words, add five to six times as much water. This dilution must now be sweetened well with sugar or other sweet. A good plan is to partly fill a shallow individual butter dish with the diluted formaldehyde and add about one fourth teaspoonful of sugar, then place the dish on the table or in the show window. The flies drink this material and die in great numbers not far from the insecticide. It is not an easy matter to control the fly in a dining-room where there is plenty of liquid material for food and drink, such as water, milk, sweets, etc., but where this can be removed in the evening and the dishes with formaldehyde substituted so that the flies will drink this the first thing in the morning the end will be accomplished much more readily. One is here taking advantage of the fact that the flies seek something to drink as soon as they "awaken" from their sleep in the morning.

MOSQUITOES.

We must now briefly turn our attention to the mosquitoes. Among the several species of these insects existing in the State of California there are also the *Anopheles* or malarial fever mosquitoes. No fact in medical science is perhaps more certainly established than that malarial fever is transmitted by mosquitoes of the genus *Anopheles*. However much a man might expose himself to the miasma of swamps and the steaming tropics he could never contract malarial fever except through the bite of an infected mosquito. Malaria is caused by an unicellular animal parasite which lives a certain part of its life in the red blood corpuscles of man. The destruction of these corpuscles when the parasites are numerous induce the paroxysm of chills and fever, which occurs at regular intervals due to the regular developmental cycle of the parasite. The direct loss of life due to this disease may not seem to be great, but it is one of those affections which produces great inefficiency in performing one's ordinary duties. Herrick has well stated the matter thus: "The loss of energy and enthusiasm, the loss of interest in one's own efforts and successes, all of which contribute enormously to the efficiency of labor and cause the wealth producing power especially in agriculture to fall short of its normal capacity, is due in a marvelous and undreamed of degree to that life-sapping disease, malaria. The man that is just able to 'crawl out of bed and drag around' is certainly not the man to accomplish an efficient and full day's labor.''

The greatest demonstrations of disease control have been made in parts of this country, in Cuba, Honolulu, and Italy, in controlling malaria and yellow fever. Considerable work in mosquito control has been accomplished in various parts of this State. Mosquitoes breed in pools of standing water, tide pools, along the margins of slowly moving streams, in tin cans partially filled with water, in rain barrels, watering troughs and the like. Indeed, very little water is necessary to breed hundreds of mosquitoes. Again, the control measures require the elimination of breeding places or the application of a chemical which will destroy the wigglers. Drainage or filling up of unnecessary pools in spring, overturning of receptacles which might collect water, in fact, a little precaution will again save many a mosquito bite and perhaps cases of malaria. A few teaspoonfuls of kerosene on a tank of water or a small pond will serve very well; open-box privies and cesspools should always be so treated at frequent intervals. In irrigating the water should not be allowed to remain in pools for long periods at a time, say not over several days. Usually twenty-four to forty-eight hours will suffice for ordinary irrigation purposes, and flooding for longer periods represents gross neglect or carelessness. Water standing over ten days would be dangerous since the larval and pupal life of the mosquito may be passed in less than two weeks. The use of metal, cement, or tile irrigation ditches which will not only prevent lateral seepage, except where wanted, will help greatly in lessening the great quantities of mosquitoes now produced in poorly kept ditches. The metal, cement, or tile ditches can be kept clean easily and the water running. Experiments on a small scale show conclusively that the addition of a very small percentage of tobacco decoction will destroy both wigglers and pupae, how successful this will be on a large scale remains to be proven, but I have hopes that it will prove out well, and will then be a good substitute for kerosene, with the addition that the nicotine containing water may be used with impunity for irrigating purposes.

If the resident of rural districts will apply himself to the correction of such unnecessary surroundings as have been here briefly pointed out, he may expect to be amply repaid for his trouble. The most beautiful and enjoyable parts of this earth are found among rural surroundings and may be made more and more so by the expenditure of a little extra energy in keeping things clean and in order—the rules of rural hygiene are few and simple. (Applause.)

PRESIDENT JEFFREY. Fellow delegates, if you would like to ask any questions of Professor Herms we will have ample time to-night.

MR. KELLOGG. I have been exceedingly interested in that paper and a whole lot of reforms have gone through my head, but there is just one question I want to clear up in my mind. I have lived in new countries at different times and where they were troubled with malaria, and we said, as the country got older, we were not so troubled with malaria. I would like an explanation of that.

PROFESSOR HERMS. Not of the true malaria, I should say. Of course, in the transmission of a disease like malaria or any one of these diseases just referred to, you must first figure on the disease being there in order to be transmitted. Of course, the house fly could not transmit any of these enteric fevers, like typhoid, if typhoid were not there to be transmitted.

MR. DARGITZ. Just a little incident that occurred about a year ago. It shows how easily we sometimes can eradicate these pests. I was called to a neighbor's where they stated that the mosquitoes had become such a pest that they were inclined to sacrifice their property and go back East, had become disgusted and thought California was nothing but a nest of mosquitoes. I made some inquiries and finally told them to pour half a cupful of kerosene in the sink and let it find its way to the cesspool through the drain, and they did so, and in twenty-four hours they said they had no more mosquitoes and had none after that all summer.

PRESIDENT JEFFREY. The next on the program is "Planting Good Health on the Farm," by Dr. W. F. Snow, of the State Board of Health. (Applause.)

PLANTING GOOD HEALTH ON THE FARM.

By Dr. W. F. Snow, Secretary State Board of Health.

Planting good health does not differ in principle from planting any other crop. Good seed must be sown in the right soil and with due regard to the environment. Many things must be done between the planting and the harvest if one expects a maximum yield. The fruit farmer follows up his planting by making a business of aiding the growth of his trees. He protects them against drought by irrigation, against frost by smudging, against insect pests by fumigation, and by the importation of friendly insects to prey upon the pest.

The infant trees are wrapped in swaddling clothes in winter and provided with sunshades in summer. Being clothed they must be fed. The farmer studies their diet and buys the necessary fertilizing chemicals advocated by the horticultural experts. Their leaves must have sun and their roots must be housed in properly ventilated soil, therefore, the farmer cultivates his land and battles with the weeds. And all the time he is saying to himself, "In a few years more they will begin to bear fruit."

The placing of wind stakes and props, the digging for borers, the all-night irrigation, the fight with the birds and the rabbits, are but incidents in the day's work of the successful fruit farmer.

And then when the crop has matured must the trees be ruined and the fruit lost because there are no strong men to harvest it? Has the farmer, in his efforts to grow trees, forgotten that it is necessary at the same time to grow boys and girls if he would ultimately reap the full reward of his planning? The labor-problem is unquestionably a serious one for California horticulturists. A most important factor in this problem is good health, and this can be cultivated, adapted to the environment, and made to yield good returns. It is, therefore, a legitimate subject for your earnest consideration during this convention.

There are two great obstacles to interesting people in the cultivation of good health. In the first place, the normal baby born to healthy parents has a tremendous vitality and power of adaptability to its environment, which distinguishes it from the little tree. This gives rise to the impression that with the baby the proportions of food and sleep, air and sunshine, work and play, are of little consequence. In the second place, from fifteen to twenty years are required to mature the crop, which since the days of slavery has had no directly quotable market value when produced.

It can be demonstrated, however, that good health is a valuable crop. Each of us, for example, expects to live to be at least sixty or seventy years old. And if we come of good stock, have been carefully cultivated and have developed good habits, we ought to live this long. Yet each of us knows of a number of friends with similar expectations who became blighted and died, some of tuberculosis, some of typhoid fever, or malaria, or diphtheria, or scarlet fever, or any one of a hundred other causes. When we stop to think of it, most of them died before the age of thirty or thirty-five. The twenty years or more they might have lived would have been most valuable to the prosperity of California. Many of these friends have been young men with families. Each man's labor would have provided at least $1,000 a year, which means a loss of at least $20,000 to $30,000 for his family. Even if he carried a $5,000 or $10,000 life insurance policy it was still poor business to die.

Suppose this young man had come out to your neighbor's farm to pick fruit and had contracted typhoid fever as a result of unsanitary conditions, which his employer permitted to exist in violation of the State law. (Professor Herms has just explained to you how this infection may be transferred by flies.) And suppose this young man's wife should sue your neighbor for damages and you were drawn for jury duty, would you award her a competence to care for her babies, or would you ask your minister to present evidence of some manifestation of Divine Providence in your neighbor's negligence? California has over six hundred deaths a year from typhoid fever alone.

Dr. Woods Hutchinson has somewhere remarked, "It is really not so wonderful that we are alive when we consider the length of time we have been at it since the original man passed the spark of life on to his descendants." The wonder is that in these millions of years we haven't learned to live longer. Within the brief period of recorded history the average length of life has been gradually lengthened. In certain countries this increase has reached fifteen and even twenty years, but the average length of life is still considerably below forty years. The addition of one year to the life of each citizen of California would be equivalent to adding 100,000 people to our industrial population. Is not this added population the thing for which our boards of trade and chambers of commerce are striving?

The Sacramento Valley farmers recently pledged themselves to spend $50,000 in advertising for additional settlers. Is it not probable that they would also invest in good health if it can be proved to be an equally good investment?

Every active horticulturist knows in a general way how much nursery stock is lost each year through the ravages of plant diseases.

He can also know, if he will, just how many babies are lost through the agency of human diseases. If he studies it out he will see that the prevention of the latter is just as important to him as the prevention of the former, even from a purely business point of view. Both babies and young trees represent potential investments from which there should be large returns in future years.

You are all familiar with inspection and quarantine as applied to fruit-bearing trees. If your right-hand neighbor's orchard is invaded by the San Jose scale you want to know it so that you may protect your own trees. It is just as logical that you should wish to know when your neighbor's child develops scarlet fever. The United States Public Health and Marine Hospital Service is charged with the duty of inspecting the passengers and crew on each incoming ship and of making a careful medical examination of all immigrants. This procedure is the same in principle as the inspection of all imported trees for evidence of plant diseases. The difference comes later when the tree has to submit to continuous observation, and quarantine or fumigation if it "catches" anything, while the newly made citizen maintains that it is nobody's business but his own what diseases he may have or how he may treat them after he gets into the United States.

Individual liberty is a precious thing to all Americans, and in order to preserve it we often permit one citizen to infringe the rights of many. One third of the business of our undertakers in California is based upon our exaggeration of individual freedom at the expense of the public. At present we are burying annually upwards of 10,000 of our children and young adults because of diseases contracted from other diseased persons, who came among them. Of course, the proposition to save these 10,000 lives a year would work a hardship on our undertakers. But this would readjust itself in fifty or seventy-five years, through the great increase in deaths from "old age," and meantime our industries would have the benefit of a steady annual income of 10,000 workers and their accumulated families. Does this not sound like a good investment?

There is another way to estimate this. The commission on conservation of natural resources, appointed by President Roosevelt, estimated the community value of the average life to be $1,500. California is thus losing approximately $15,000,000 a year because no provision is made for enforcing laws already on the statute books. All these things are not theory merely, they are hard business facts. We have been applying to human life in California exactly the same principles which we are now condemning our timber barons for applying to our great forests. With him it has been so many million feet of lumber per year, with us so many million hours of labor. We have cared no more for repopulation than he for reforestation.

We must include conservation of health among our other plans for the unborn generations if we are to hope that America will continue her progress toward supremacy in the industrial and scientific world.

The requirements of good health are very simple to enumerate. They are sunshine, fresh air, good food, enough sleep, plenty of play, work for which one is adapted, and protection from the disease invaders. But these requirements are not easy to fulfill for many occupations even in California. Are they possible on the farm?

First, sunshine. It would seem so, and yet how many farmers' wives scarcely see the sun from one week's end to the next? How many farmers' daughters contrive to avoid the health-giving rays of the sun, the while they industriously apply so-called skin foods? How often does one see at the seacoast whole families taking the fashionable sun-cure in bathing suits, or with bare heads and sleeves rolled up. This is the same sun which shines on the ranch, and is so carefully excluded from the parlor and bedrooms lest it fade the carpets.

Fresh air should be available on the farm, but often the only member who uses it to any considerable extent is the farmer and he has it only in the day time when he needs it least.

Fresh air has different qualities. There is the cool breeze that comes in off the ocean, and the hot wind that blows across our great valleys, and the night air currents that flow down through our murmuring forests. Each plays its special part in the environment of the body, but all are fresh, and are alike invigorating to the lungs. The fallacy of dangerous night air has cost the human race untold numbers of lives. The sleeping porch is the most effective weapon we have thus far used to combat tuberculosis. The old-fashioned fireplace was a most important fresh air apparatus, because it constantly drew into the house great quantities of out-of-door air to replace the hot air it sent up the chimney. The present day air-tight heater and oil burners are economical of fuel but most expensive in headaches, drugs, and doctors' bills.

It is poor economy to utilize unfinished attic space for bedrooms for the growing family. The rooms of a house which depend on ground air forcing its way up through the walls and floors from mildewed cellars or malodorous kitchens, or closets, are not the rooms in which good health will flourish. Such air will not cause any specific disease, but it will lower the resistance of the body to disease. Sanitarians estimate that sleeping rooms should have for each occupant at least 500 to 1,000 cubic feet of air space exclusive of the cubic space taken up by the bed and other furniture, but this depends on the ventilation, *i. e.*, the frequency with which the air of the room is changed. The farmer who screens in his porches for sleeping purposes and uses the bedrooms only as dressing rooms will have plenty of air and few bills for medicine.

The selection and preparation of food for the family is a very important factor in farm life. The farmer knows his land and sows his crops advantageously with reference to the soil. It is equally important that the farmer's wife know her family and prepare her table according to the varying needs of the individuals. Simplicity, variety, the best materials, and proper cooking are the general requisites. The normal healthy individual may count on his appetite to guide him in what he eats from day to day. His stomach is simply one of the way stations along the alimentary canal, from which the body helps itself to such tissue-building and energy-producing ingredients as it needs, leaving the excess to be passed on and discharged day by day. "I never know I have a stomach," is only another way of saying that one has good digestion. But if this be said by all the members of the family, it means there is a clever housewife in command of the kitchen, who realizes that her position is that of commissary general. The standard army ration is not sufficient for her needs. First, she must provide her husband with sufficient energy-producing food for the heavy muscular activity of his day's work. Then she must provide the body-building food necessary for her children, who are sitting quietly in school, but are growing all the while, then the baby needs his food prepared and administered with clock-like precision. It is necessary that she plan her own diet, and have regular hours for her meals. Then. if she provides the means for the farm hands, she must study history and know how to cook the national dishes of her husband's employees. And this is only the foundation of her problem. Cooking for the climate is a most important part of her work. This means pork and beans for cold days and cool salads for hot days. It means shifting the meat dishes to the breakfast meal in the picking season and the substitution of nuts and macaroni for the dinner meat in the idle rainy season. It means hot, appetizing heavy suppers from June to October and simple bread and milk suppers before the open fire from December to March.

Cooking for one's ancestors is more important than is at first apparent. Suppose a young Massachusetts farmer comes to California to raise apples and eventually marries one of the daughters of old Spain. Is it not certain there must be some adjustment between his ancestral love of pie for breakfast and her desire for enchiladas?

Enough sleep is not a matter of the number of hours we may spend in bed. The purpose of sleep is to provide complete cessation of activity, so that the body may be repaired for the work of the next day. The individual who makes a business of sleeping and who sleeps in the open air will get his sleeping done in much less time than the one who cultivates the habit of reviewing the day's events and making out a trouble schedule for the next day before he gets to sleep.

Play is but another form of rest for the adult. Play serves many purposes for the child, but it is a necessary thing for the father and mother as well as for the child. The parents who are too old or too busy to play with their children will find their influence over those children steadily slipping away. It is real economy for the mother to take the girls to the best theater plays and to hear good music. It pays for the father to go with his boys to see the city, and to show them what is safe and what is unsafe in its varied amusements. It is a good investment to take the family to the high Sierras or along the coast in the summer. The telephone is not a luxury. It is important for the tired mother to have her recreation, and the relaxation of a daily visit with her distant neighbors on a ten-party line is part of the family play. The current magazines and a good phonograph or pianola with well selected music yield big returns on the purchase price.

It pays to grow flowers and to use them in the decoration of the house. The box of candy one occasionally buys for his wife is not foolish sentiment. These are the things that make the *home*, as distinct from the house. Anything will serve for a house, provided it be dry and light and airy. By this I do not mean that a modern, well arranged house is not desirable. A convenient kitchen and the various labor-saving household devices are worth all they cost. But the most sanitary and convenient farmhouse that can be built will soon degenerate in the course of a generation into a "chuck house" for hired men unless the atmosphere of the home be created. This requires study and the well directed expenditure of some money. The Country Life Commission has pointed out in no uncertain terms that if we would conserve our farms we must make them livable.

How often have the half-ills and discontentment due to unvaried and incessant work on a cheerless, homeless farm led children to unwise immigration to the city. The farmer is too busy, the mother is too overworked and disheartened by the monotony of her daily round to investigate the half-ills of these children, and in the end they go. The neighbors say, "Well, I don't rightly know what was the matter with the Doe family. They didn't like the farm. The old man and his wife still stick to it, but the children have all scattered. The two girls are clerking in some store in the city, and the last I heard of the youngest boy he had a job hauling lumber somewhere in the mountains. Poor stock, I guess." More often it is poor opportunity. If our farmers would apply the same keenness of observation and deduction to the development of good health on their farms that they apply to the development of good trees, the number of farmers whose sons are also farmers would increase many fold.

The generalities which have been emphasized thus far deal with things which a man may provide for himself and his own family without coöperation from his neighbors, but there are many other things entering into the health of the farm which require coöperative management. Professor Herms' excellent paper has demonstrated how the mosquitoes of the farmer's right-hand neighbor may bring him malaria, how his left-hand neighbor's flies may bring typhoid fever. His neighbors to the north come to call, bringing their baby, and the baby leaves the whooping-cough. His neighbors to the south in the course of years contribute many expensive things. Scarlet fever comes to him in his cream cans, which are returned from the city each day. The passing tramp frightens him with smallpox, and the temporary fruit picker suggests many possible dangers. It is only by community coöperation that these experiences—expensive alike in life and money—may be avoided.

In conclusion, let me repeat good health is a crop, and demands attention and necessary outlay of money if adequate returns are to be expected. (Applause.)

PRESIDENT JEFFREY. I think you will all agree that we have had a treat to-night, and I know how well you will all appreciate the remarks we have heard from the two friends who have come down here to-night for this special purpose.

The convention then adjourned until December 10, at 9.30 o'clock A. M.

FOURTH DAY.

WATSONVILLE, CAL., December 10, 1909.

PRESIDENT JEFFREY. The convention will please come to order. I would like to ask if the Committee on Resolutions are ready to finish up what little business they have?

MR. KELLOGG. On that matter of unfinished business yesterday, laid over for to-day, the committee would amend their report and have it read as follows:

RESOLUTION AS TO FORMATION OF PROTECTIVE LEAGUE.

Whereas, There are many general problems affecting the fruit industry aside from the marketing of fruit, in which our interests are identical, and upon which we can unite for the good of all concerned upon common ground; therefore, be it

Resolved, By the Fruit Growers' Convention, that the fruit interests would be best subserved by the organization of a league, or association of some character, to look after the freight rates, standardizing of the fruit pack, uniformity of packages, and other matters, looking to the harmonizing and helping all interests.

Resolved, further, with this end in view, we recommend that a committee of ten fruit growers be appointed by the Chairman of the convention representing all interests, as far as possible. This committee to meet as soon as possible, formulate a plan of organization with such constitution and by-laws as they may think wise, and submit for approval to a delegated convention to be called by them, in the city of Sacramento, within the next sixty days, if practicable, the said delegates to be duly accredited from established organizations representing the fruit interests of the State. We recommend that the said delegated convention effect a permanent organization, for no profit to themselves, but for the general interests of the whole fruit industry.

Mr. Stephens moved the adoption of the resolution and his motion was duly seconded.

PRESIDENT JEFFREY. The resolution means simply that a committee of ten fruit growers will be appointed to formulate a plan for organizing a protective league of some kind to take up general propositions relating to deciduous fruit and grape industries, general propositions touching the interests of everybody connected with the business, railroads, fruit distributors—every interest must be handled by some central authority.

The resolution was unanimously adopted.

MR. JUDD. *Mr. Chairman, Ladies and Gentlemen:* We had a paper yesterday, or rather a speech made by Mr. Irish, which covered a very large scope and at the same time it brought the question of education down to my idea of what our youths, especially the agricultural youths of this State should have. He said nothing about the Polytechnic School at San Luis Obispo, which has something like 150 or 160 students. It is one of the most progressive institutions of learning in this State. It is a place where a young man can get any kind of an education he wants, whether agricultural, mechanical or almost any other except the professional education. I want to call your attention to that particularly in the form of a bulletin, the agricultural number, published by the class, and all you people that have an interest in the Polytechnic School, which is the very essence of education for our agricultural youth. I want you to get one of these and also the bulletin, and it will give you some idea of what is being done in the State for your boys and your girls that you don't know anything about.

PRESIDENT JEFFREY. We will now have the "Precooling of Fruit," by George D. Kellogg of Newcastle.

MR. KELLOGG. Mr. Chairman, first I want to say a word. I have taken a great deal of interest in something more than the fruit industry, and that is the character of this convention. We have met in this beautiful place that many of us hold sacred and I have yet to see the first breach of good behavior in recognition of the place in which we have met. I believe the fruit growers are a pretty good class of people to be with, clean, intelligent, upright. Mr. Dargitz insisted upon a text, and the only one I can think of just now, and I can't tell you just where it is, but if he will look in Ezekiel somewhere he may find it: "For because ye are neither cold nor hot I will spew ye out of my mouth."

MR. DARGITZ. Revelation.

MR. KELLOGG. I guess it is. [Laughter.] I am not here to throw any hot air, but I am to throw pure cold air. I don't come before you with any scientific proposition. I am simply going to deal with facts as I have found them from my own observation. I let the theory go to these professors who study it and know why these things are so.

PRECOOLING OF FRUIT WITH DRY COLD AIR FOR SHIPMENT.

By Geo. D. Kellogg of Newcastle, California.

Mr. President, J. W. Jeffrey, Ladies and Gentlemen: Reform and progress have become the watchword of the California fruit men. It is a well known fact that a slight bruise or abrasion on any fruit will affect the keeping quality of the same; this has been discovered, and padded picking baskets or buckets will be installed during the coming season; springless wheel sleds will be discountenanced and discontinued by the up-to-date grower and vehicles with springs will be used in their place to give ease of carriage and supplant them. The frequent dumpings from the tree to the packing shed will be eliminated, and the farewell to the old dead axle wagon between the packing shed and the shipping house will be sounded. The standardized pack, with correct comprehensive markings upon the package, under the supervision of a competent corps of independent inspectors will be a reform of great consequence, bringing increased reputation and standing, as well as additional dollars for our California fruits.

All this, and still there stands before us the great problem of how to get this fruit into the Eastern markets in such condition as to command the attention and admiration of the consumer. Refrigeration has been tried, and under the old system has proven a help—though expensive. The crying need is for something better.

The Agricultural Department at Washington, D. C., recognizing the great importance of the fruit industry, detailed their expert, G. Harold Powell, as Pomologist in charge of Fruit Transportation and Storage Investigation. This worthy official came to Newcastle, California, in the summer of 1905 and began his investigations and experiments, and the taking of valuable notations. He improvised a cold storage car, and after holding the fruit for twenty-four hours or more, it was transferred to another cold car and shipped to the Atlantic coast.

This experiment was conducted during the extreme heat of an extreme season and proved beneficial. These experiments were conducted from my office, with the coöperation of the fruit shippers of Newcastle. We had free access to the valuable data obtained from Mr. Powell's observations and notes. Frequent discussions led us to believe that if the fruit could be precooled by the single box before placing in the car, quicker and better results would be obtained. Mechanics of inventive talent and experts in refrigeration were consulted, combined with those having experience in handling of fruit and knew its weaknesses and some of its possibilities. The situation was studied, the conclusions reached from observation, that fruit shipped under ice with no previous preparation was inclined to arrive at destination damp, and this dampness would create a mold that would be injurious to the fruit. It was also demonstrated by the Government experts that ripening proceeds much more rapidly when a fruit is severed from the tree, so that it comes nearer the point of decay in a few hours, or days, than it would have been if left hanging on the tree in the same temperature for a much longer period; therefore, the ripening must be checked as soon as possible after picking to prevent premature decay.

Experiments show that mold grows in the room in which the fruit is placed, if the air in the room is moist, and the flavor deteriorates if the air is impure, especially is this true as regards mold upon grapes. Dry cold air will prevent the development of rot, and pure air preserves the delicate quality of the fruit. Therefore, *a dry cold pure air* is ideal for the preservation of fruit and to maintain its natural quality.

The conclusions reached were these: The successful transportation of perishable fruits in refrigeration depends, primarily, upon the sound condition of the fruit; upon cooling it as soon as possible after it has been picked; on shipping it in packages which cool quickly thoughout; on a *dry, pure, cold air*, uniformly distributed in the car, or compartment, and on a free circulation of such air throughout the packages, and this cooling process should not cease until the pit, or center of the fruit, has been as completely cooled as the surface, for practical results.

With these ideas, and to reach the results sought after, a unique and practical machine was invented, which conveyed single packages of fruit through insulated compartments through which a stream of dry cold air was forced, and the fruit cooled thoroughly to the center, and to any desired temperature. This was done by the ammonia process, instead of ice. From this machine the fruit should be landed in a cooled room, which is vestibuled with a precooled car and this car loaded and closed up and shipped through to destination with the initial icing. Cars so treated will carry to any market in the United States without reicing, and will arrive dry and in sound condition. At least, that has been my experience and observation from my experiments with fifty-seven cars precooled with this process during the season of 1909, and in this season of scarcity of cars and poverty of ice. Of these fifty-seven cars thus treated there has been but one claim made for loss and damage in transit, and that car was precooled on Saturday and left standing in the open air until the Tuesday following, waiting for a car to come to be loaded into; three days in the heat nullified the precooling, I suppose, and bad results followed. I shipped an equal number of cars during the season that was not precooled, and there was many claims for damage made. The usual time it has taken to reduce the temperature of these cars has been from one and a quarter to two hours. I experimented with cars in which the fruit temperature had been reduced from seventy-six degrees to from forty-four to fifty-five degrees, while the open air temperature would be ranging anywhere from seventy-five to one hundred degrees in the shade, the fruit arrived at destination without complaint. These statements may be verified from the files in the office of the California Fruit Distributors in Sacramento, through whom all my claims on loss in car loads are made. I have with me a list of the precooled cars, the date when shipped and the destination; by a comparison of this list with their files will verify my statement.

With but two exceptions did I make known to the consignees what cars were precooled and what were not, and no attempt was made to get special reports upon the car; I took this method that I might know the facts, for as my fruit is most usually sent to the f. o. b. markets, and if it arrives without complaint, the draft is paid with no grumble from the consignee, it becomes prima facie evidence to the shipping fraternity that the condition of the fruit is above suspicion; and when the fruit is delivered to the auction and sold at the best price with no one to "boost" the sale we are ready to accept the theory that the fruit was all right.

On one car I advised the consignee in New York, Mr. C. E. Thurston, that a certain car was precooled, and asked him to note its condition; this car sold at top price and the returns came back with the notation from him that "precooling was all right." On another occasion I notified Messrs. Longfellow Bros. Company of Minneapolis to note conditions of a precooled car, P. F. E. No. 6100, shipped on June 25th with an initial icing only, and the following report was received from them:

> "Green fruit from Newcastle, Cal., received by us this morning; peaches and plums were in splendid condition, being firm and dry, and did not develop sweat after unloading, although the day was quite warm. We believe that your system of cooling fruit before it is loaded into the car will place the fruit on this market in much better condition than the present plan of icing cars and loading the fruit while warm. Wishing you success in your efforts to improve conditions in the fruit business, we are,
>
> Sincerely yours,
>
> LONGFELLOW BROS. COMPANY."

On August 27th, one of the hottest of the season, I loaded a mixed car of peaches, precooled, into a car that was cooled by being vestibuled to the cold room, with no ice, the car closed; it left the next morning. On September 7th the car was sold in Minneapolis auction, the twelfth day from the picking, and this car of peaches and assorted grapes was sold for $875, being the average price paid for fruit in that market that day.

Note that this car was *not cooled by ice, was not iced en route*, and was in condition to sell at average price; the cost of refrigeration was only the cost of the precooling; the cost for hauling five and a half tons of ice was saved the transportation companies, and the expense of holding the trains, with five or six icings, was all saved, so far as this car was concerned. All matters of great consequence to the railroad operating departments, which if could be applied to whole train loads, would mean many hours of time saved in transit of the trains, to say nothing of great bunkers of ice, and the expense of many men saved.

These fruit meetings are not so much for hearing theories as for facts. California fruit men are facing active and intelligent competition from many states in the Union that have the advantage of hundreds, and even thousands, of miles of hauling over us. We have the quality, size and beauty if our fruit is allowed to mature before picking, properly selected and packed, and displayed before the buyer free from mold, or moisture, and with what is known as a postage rate of one dollar to the markets of the East, as some other fruits are hauled, the California fruit grower can meet all competition.

I have demonstrated to my own satisfaction that the best results can be obtained only through the precooling of the fruit, each individual package treated and cooled alike to the center or pit before loading in the car, precooled with *dry pure air*, removing all moisture from the fruit, so that it arrives at destination with no moisture perceptible. To reach this desired condition, I am satisfied that if so treated that an initial icing is sufficient to insure good delivery. (Applause.)

PRESIDENT JEFFREY. If there is no objection on the part of the convention we will now hear the report of the Committee on the President's Address. Mr. Rixford and Mr. Bishop were the members of that committee.

Mr. Bishop read the following report:

We, your committee appointed to consider the President's Annual Address to this convention, beg to report as follows:

We find the address prolific of thoughtful suggestions on important questions which are thus brought to the earnest consideration of the fruit growers of the State.

We would especially commend to your attention the suggestion that coöperative leagues or committees, such as the Citrus Protective League, be formed to consider the interests of each branch of the fruit industry, and to handle every proposition that has a general bearing on the particular branch it represents and in which all can rely in times of peril.

We indorse his idea that we are not confronted so much by the problem of overproduction as by that of underconsumption leading up to the stamping out of dishonest packing and standardizing the California pack as a business proposition, which he brings to our attention for the first time, and which must inevitably lead to further extension of the markets for choice fruit on its merits.

The President should be commended for the movement he has inaugurated recently, in holding community meetings of fruit growers in various places in the Sacramento Valley and which are in the months to come to be extended to other parts of the State, to consider the economic questions connected with the industry. It seems to your committee that these meetings will be productive of much good in threshing out various problems of especially local interest and leave them in a concentrated form for consideration on the broader plane of the State convention.

And we would earnestly call your special attention to his suggestions concerning the disapproval of the fraudulent land booming, hoping and believing it should receive the emphatic indorsement of every loyal Californian.

Finally, we commend to the convention a thoughtful consideration of the entire document as filled with timely suggestions for the good of the great industry in which we are all interested.

G. P. RIXFORD.
ROY K. BISHOP.

MR. BISHOP. The Citrus Protective League in southern California is a league in which the shipper pays so much for every car load of fruit he ships, and that money is used to gather information and protect us in the legislature and in congress. (Applause.)

Mr. Stephens moved the adoption of the report.

The motion was duly seconded, and, being put by Mr. Stephens, was unanimously carried.

PRESIDENT JEFFREY. I wish very briefly to thank the committee on the President's Address for the sentiment conveyed and for the beautiful language in which it is expressed.

MR. DARGITZ. Just one moment, before we get so far away that we forget it, a remark made in Mr. Kellogg's paper that it is facts and not theory that we are after. I am sure, as all practical growers, we recognize the great importance of facts, the practical knowledge that comes to us from the growing and handling of fruits, and I am sure every one of us who has looked into the subject very far will very greatly appreciate the theories that have come to us from the scientific side; and perhaps one of the greatest values that comes to the orchardist and fruit grower from these conventions is the fact that here the two extremes—one of practical knowledge and experience, and the other of the theoretical and scientific—meet and blend, and out of the two going forward we have the results that shall prove success for us. (Applause.)

PRESIDENT JEFFREY. The next topic for consideration will be "Grape Transportation and Storage." You all are acquainted with the work of Mr. Stubenrauch; you are personally acquainted with him, most of you, and you know him to be a most excellent and capable man. (Applause.)

MR. STUBENRAUCH. *Ladies and Gentlemen:* Contrary to my usual custom, I will read my paper. There are so many things to be said that I have formulated it in a paper.

GRAPE STORAGE AND TRANSPORTATION INVESTIGATIONS OF THE U. S. DEPARTMENT OF AGRICULTURE.

By A. V. STUBENRAUCH of Washington, D. C.

The grape storage and transportation investigations of the Bureau of Plant Industry of the United States Department of Agriculture, begun in California several years ago, form part of the Fruit Storage and Transportation Investigations of the Department carried on in different sections of the United States. These investigations include a complete study of the various problems connected with the handling of fruits in storage and transit—the two are practically the same, fruit in transit being simply held under storage conditions while being hauled across the continent. Naturally, there are many factors which have to be considered, but the investigations have narrowed down principally to a study of the relation of handling in picking, packing, and preparation for market to the occurrences of decay and deterioration in storage and transit. This part of the problem is fundamental, and it frequently happens that when once this is thoroughly understood, the other parts of the investigation are comparatively simple.

From all the Bureau work on this problem one fundamental principle has been deduced, a principle so important that frequently the only problem connected with the avoidance of troubles in storage or transit is an application of the principle to local practice.

It has been shown that the different kinds of molds which cause the most common forms of decay in fruits while in transit and in storage are unable to penetrate the sound, normal, skin of the fruit. These molds generally gain entrance through mechanical abrasions produced in the preparation of the fruit for market. It is not unusual to find 10 per cent of apples showing cuts or abrasions in the skin. Small fruits are more commonly injured, while oranges frequently show from 10 to 50 per cent of the fruit with the skin cut by the clippers in severing it from the trees or by rough handling of the fruit in the packing houses. It has been demonstrated that by careful handling in the picking and packing of oranges under commercial conditions the injuries can be overcome, and the decay can be almost wholly eliminated.

During the past four years the storage investigations have been extended to the table grape industry of California. These investigations were started with two main objects in view: A study of the factors which affect the keeping quality of grapes in transit and storage and the possibility of extending the markets and season of California grapes, ultimately with the hope of replacing the two million dollar importations of fresh Spanish grapes with the California-grown product held in common or cold storage. At present practically the entire Tokay grape crop has to be marketed within sixty days. Within a few years the output of this variety will nearly double. The necessity of either extending the season of marketing or of developing new markets becomes of vital importance.

COLD STORAGE EXPERIMENTS.

Our first efforts were directed toward the storage problems, and the results obtained in this work had a direct bearing on the transportation problems which were to follow later. A careful study of the behavior of a number of important grape varieties was begun. Some of these were grown commercially, some were not, and were included in the experiments to determine their suitability for introduction to commercial vineyards. The list of varieties includes the following, most of which were obtained from the University Experiment Station near Tulare, through the courtesy of the California station officials: Flame Tokay, Muscat, Mallaga, Thompson Seedless, Ferrara, Emperor, Verdal, Black Prince, Cornichon, Huasco, Bowood, Pizzutella, Perruno, Chasselas de Fontainebleau, Sabalskanski, and Almeria. Last year and the present season varieties from Lodi included the following: Flame Tokay, Emperor, Ferrara, Verdal, and Cornichon. This season a number of new varieties grown on the Government experimental vineyards at Fresno and Oakville were added to the list, but as this work is only begun these varieties need not be named here.

The preliminary work included a test of different methods of packing: In crates without filling, and in tight boxes with various filling materials in comparison with ground cork, such as is used with the Almeria grapes imported from Spain. The list of packing materials, besides the ground cork, included paper, both shredded and as a wrapper, wheat bran, corn meal, ground corn pith, shredded and cut tule and redwood sawdust. All of these substitutes, except redwood sawdust, have been found unsuitable and have been abandoned. Redwood sawdust has been further tested, and all of the results so far show that it is superior to the cork. The grapes packed in this sawdust hold longer and in better condition, and in future we shall probably confine our investigations of grape fillers to this material. It seems particularly fortunate that so valuable a substitute is at hand. It would be impracticable to use cork in this State on a large scale, both on account of its high price and comparative scarcity. It is evident that the importers of Spanish grapes are becoming aware of the superiority of redwood, as already inquiries are being made in the interest of foreign growers regarding the practicability of obtaining this sawdust in quantity.

It is impossible at this time to state the reason for the better holding qualities of the redwood sawdust. At first it was thought to be due to the greater fineness of the material, but a comparison of it with cork ground or shredded to the same degree of fineness as the sawdust, while it shows some difference in favor of the finer ground material, does not indicate that this is the only cause. So far, no attempt has been made to treat the sawdust in any way except to be sure that it was thoroughly dry. The material has been obtained from planing mills working on dried lumber, and consequently the dust has been rather fine. The use of this fine sawdust this season on a rather large scale shows that while the fine material holds the grapes in prime condition it has a distinct disadvantage in clinging tenaciously to the grape berries, especially around the pedicels and it is difficult to dislodge these fine particles without a strong air blast. It is, therefore, evident that before redwood sawdust can be used commercially it will have to be freed of the fine dust and splintery particles. Millmen assure us that this would be a comparatively simple and inexpensive process by using a fan, and it could be done at the mill without difficulty if the demand for the cleaned sawdust becomes great enough.

The flavor of the grapes packed in redwood has never been found to be tainted as long as the sawdust is pure. A slight mixture of pine or cedar, however, seems sufficient to flavor the grapes when held in storage for some length of time.

The storage investigations show that for long holding a filler will have to be used. All varieties with the exception of the Almeria, and possibly the Emperor, do not hold in first-class condition longer than thirty to forty days packed in crates, or too short a time, usually, for the holiday trade, which is the market offering the best demand for fancy grapes in good condition.

Table No. 1 shows the results of the cold storage experiments of last year (1908). The data are given in terms of the number of days after storing, when the fruit showed 5 per cent and 15 per cent deterioration, including decay, physiological breakdown, and shelling from the stems. These results were obtained by an actual determination of the percentages by weight, care being taken to segregate all the unsound berries. It is difficult to determine the exact commercial limit, because market conditions vary so widely in different sections and in different seasons. It is safe, however, to say that it will not pay to store anything but the very best and fanciest fruit, not only on account of the better keeping quality, but also because a relatively high price must be expected, and buyers are always more critical and particular when prices are high.

TABLE 1.

Results of Holding Table Grapes in Cold Storage (32 degrees). 1908.

	Packed in Commercial Crates.		Packed with Coarse Cork Filler.		Packed with Fine Cork Filler.		Packed with Redwood Sawdust.	
	5 Per Cent Deterioration After	15 Per Cent Deterioration After	5 Per Cent Deterioration After	15 Per Cent Deterioration After	5 Per Cent Deterioration After	15 Per Cent Deterioration After	5 Per Cent Deterioration After	15 Per Cent Deterioration After
Tulare varieties:	*Days.*	*Days.*	*Days*	*Days.*	*Days.*	*Days.*	*Days.*	*Days.*
Almeria (Ojanez)	70	110	105	121	120	175	155	250
Cornichon	--------	--------	80	92	70	95	85	125
Ferrara	35	45	80	100	80	105	--------	--------
Flame Tokay	--------	--------	45	60	55	80	--------	--------
Huasco	--------	--------	--------	--------	60	75	90	105
Malaga	--------	--------	80	100	60	85	80	105
Perruno	45	50	50	75	60	90	80	110
Pizzutella—								
Early picking	40	60	55	70	55	75	--------	--------
Late picking	20	40	--------	--------	50	65	65	90
Verdal	5	15	65	90	60	90	45	80
Muscat	30	65	55	75	60	70	75	100
Lodi varieties:								
Cornichon	--	--	----	----	75	100	----	----
Emperor	35	60	55	65	80	105	120	180
Ferrera	--	------	-------	--	75	85	--	--
Flame Tokay—Sandy soil	--------	--------	--------	--------	55	65	--------	--------
Flame Tokay—Sandy soil, late picking	--------	--------	--------	--------	30	45	--------	--------
Flame Tokay—Sandy soil, late picking	--------	--------	--------	--------	40	55	--------	--------
Flame Tokay—Black lands, late picking	--------	--------	--------	--------	70	85	--------	--------
Verdal	--------	--------	--------	--------	60	90	--------	--------

The limits given in the table are more or less arbitrary, but the experience gained in the four seasons' investigations show them to be both fair and conservative. It has been found from the examination of a very large number of grape packages that up to 5 per cent deterioration would be considered commercially sound, and decay to this extent would not be noticed on the market unless it is all at or near the top of the package. Between 5 per cent and 10 per cent would be noticeable and would detract from the market value of the fruit, while 15 per cent or over could hardly be disposed of except at a heavy discount. The 15 per cent date is, therefore, given as the extreme limit of the marketableness of the fruit. The range of days between the 5 per cent and 15 per cent limits gives a very good idea of the rate of deterioration, which varies considerably with different varieties and with different packing materials. As a general rule, the range is shortest in the crates without a filler and greatest in the redwood sawdust packs.

The grapes were picked when their appearance indicated full maturity without overripeness, and this naturally differs with different varieties. It is difficult to determine the exact time when grapes are ripe. In our experiments color, sweetness, and firmness were used as the determining factors. Experiments with green and overripe fruit show that both will not hold long or in good condition; the former shrivel badly and shell from the stems, while the latter soon decay or break down physiologically. One comparison of early and late picking is shown in the table: Pizzutella, early picked (Sept. 16), remained in good condition forty days in crates, while the same variety picked two weeks later held only twenty days to the 5 per cent limit.

The fruit was all very carefully handled and was nearly all packed by ourselves. Great care was used in culling to eliminate all unsound or injured berries, and the packing was done carefully to avoid injury in handling. Packing was done as quickly as possible after picking and the packages were gotten into the cold storage rooms with the least possible delay. Not more than thirty-six hours elapsed between picking and placing the fruit in cold storage.

It has been shown in the investigations with other fruits that one of the most important factors in the successful handling of fruits, either in storage or in transit, is quick shipment or quick cooling after the fruit is harvested. The sooner the fruit can be cooled after it leaves the tree or vine the longer time it will continue in first-class condition. This is especially true where there are any appreciable mechanical injuries in handling. It has been shown with oranges, for example, that after a delay in shipping or cooling of two to four days the decay in transit may be from two to five times greater than under immediate shipment or cooling, depending upon the amount of mechanical injury in the fruit. These factors of quick shipment and quick cooling are found to be even more important in the case of table grapes than they are with oranges, for the reason that the ordinary grape package offers ideal moisture conditions for the development of molds, and if the proper heat conditions are present molds are almost sure to occur. When a filler is used quick cooling is just as important, if not more important. The filler acts, to a certain extent, as an insulation, and cooling will be relatively slow under the best conditions. The converse is also true, and consequently the fruit should be packed as cool as possible. A very appreciable effect can be gained in this respect by taking advantage of natural cooling overnight, and where picking is done in warm weather it is always best to allow the grapes to remain open over night and pack the next day while cool. We had a good illustration of the deleterious effects of warm packing and delay in cooling during the present season. A number of varieties, packed at Fresno at a high temperature, were in some way delayed several days by the express company in transit from Fresno to the point where they were stored. The first inspection of these lots made a few days ago showed every one long past the 15 per cent limit, while a few packages of the same variety stored locally and quickly cooled are still in first-class condition.

The question has been asked whether grape storage will ever become a commercial business. We believe it will, and plans are being considered by the Bureau to extend the investigations along commercial lines, and some of the grape growers of the State also are planning to make a commercial test next season. In the carrying out of these investigations, nothing has been done which can not be done under commercial conditions. The problem connected with the proper condition of the sawdust and its preparation for use will be investigated. The one great governing factor will be the introduction of these grapes into the markets. Just how this can be done remains to be worked out.

Quite an appreciable local market has been developed for cold storage grapes in southern California. The fruit is hauled to the storage rooms direct from the vineyards and held loosely in small field boxes. The growers have learned to handle carefully in picking and culling, and the grapes are placed in storage as soon after leaving the vine as possible. The varieties used are Flame Tokays, Muscat, Malaga, Emperor, Verdal, and Ferrara. The first two are held in nice condition for Thanksgiving and the rest for the Christmas market.

I can not close this discussion of the results of the cold storage experiments without calling special attention to the Almeria, or more properly Ojanez, which is the variety mainly shipped from Spain packed in cork. We have been able to obtain small quantities of this variety from the Tulare Station and the results have been most encouraging. A glance at the table shows how far superior this variety is for holding than any we have had under observation. It seems especially fitted for this purpose, and it is a pity that it has not been successfully grown commercially in California. It seems that the variety was given a wide trial years ago with uniformly poor results, due, we now have reason to assume, to the fact that proper treatment was not given it. The vines have to be long pruned and possibly may need trellising in this State. The fruit has such splendid shipping and keeping qualities that a systematic and thorough study of its cultural requirements in California is well worthy of attention.

TRANSPORTATION INVESTIGATIONS.

These investigations were begun at Lodi last year (1908) and were continued during the grape shipping season just closed. The work consisted mainly in the study of the relation of handling in picking, packing, and shipping to the occurrence of decay and deterioration of table grapes in transit from California to Eastern markets. For several years considerable loss from decay has resulted in the shipments of Flame Tokay grapes from Lodi, and it was at the urgent request of the grape growers and shippers of that section that the Bureau investigations were undertaken. When we began work at Lodi we had no theory other than the general principle worked out in the case of other fruits and in California grapes in storage: That the common molds, which are the cause of the ordinary forms of decay of fruit in transit and storage, have not the power to penetrate the sound normal skin of the fruit. As mentioned in the storage investigations above, it has been found that the molds gain entrance through mechanical abrasions made in the skin of the fruit in preparing it for market, and that if the skin can be maintained in sound condition the ordinary decay will be prevented.

The plan of the work consisted in forwarding a number of crates and boxes of grapes, packed under known conditions, through to New York, where one of the Bureau staff received the fruit and carefully inspected it. This inspection consisted in cutting apart all bunches and segregating the decayed and injured berries and determining the actual percentages by weight on the day of arrival, and three, five, and seven days after arrival. Last year twenty-two shipments were made. This year thirty shipments were put through. In each car there was an experimental series consisting of eight crates or boxes: two were the ordinary commercial pack, two were a careful commercial pack put up either by ourselves or a careful packer working under our supervision. In this careful pack we attempted to do nothing more than to be sure that the bunches were carefully culled and placed in the baskets without further injury. All the careful packs were put up in two-basket crates. Along with these crates were two boxes each of the same fruit packed in ground cork and redwood sawdust. One crate or box of each pack was placed on the bottom tier of the car and one of each on the top tier. In each car, therefore, we had the same fruit handled in different ways, thus eliminating all factors except the handling. This year we have obtained data on the equivalent of about 250 crates, or sufficient to place the work on a practical basis.

TABLE 2.

Average Percentages of Decay in Shipments of Tokay Grapes from Lodi to New York. September and October, 1909.

	Commercial Pack Crates.	Careful Pack Crates.	Packed in Ground Cork Boxes.	Packed in Redwood Sawdust Boxes.
On arrival—				
Bottom tier	4.06	0.85	0.79	0.33
Top tier	7.51	1.63	2.11	0.31
Average	5.78	1.24	1.45	0.32
Three days after arrival—				
Bottom tier	8.96	1.95	2.95	0.62
Top tier	11.62	4.51	2.40	0.75
Average	10.29	3.23	2.68	0.69
Five days after arrival—				
Bottom tier	12.68	3.67	4.94	0.81
Top tier	18.88	8.73	4.36	0.82
Average	15.78	6.20	4.65	0.81
Seven days after arrival—				
Bottom tier	18.66	6.53	5.75	1.03
Top tier	21.78	13.35	5.70	1.37
Average	20.22	9.94	5.73	1.20

In Table 2 and accompanying chart the data from all the shipments have been brought together and show the actual percentages of decay found in the different lots on arrival and up to a week later, the fruit being held under open market conditions. These data show a wide difference between the commercially packed and the carefully packed crates and between the bottom and top tiers in the cars. The average on arrival in the commercial crates was 4.06 per cent on the bottom tier and .85 per cent in the careful pack at the same place in the car. On the top tier the figures are 7.51 per cent and 1.63 per cent, respectively. These differences were maintained during the time the fruit was held. Three days after arrival the commercial pack showed 8.96 per cent on the bottom tier and 11.62 per cent on the top. The figures for the careful pack at the same time are 1.95 per cent and 4.51 per cent. Five days after arrival we have 12.68 per cent and 18.88 per cent for the bottom and top tiers in the commercial pack and 3.67 per cent and 8.73 per cent for the careful pack, respectfully. Seven days after arrival the commercial pack had increased to 18.66 per cent on the bottom tier and 21.78 per cent on the top tier, while the careful pack had reached only 6.53 per cent and 13.35 per cent, respectfully. The effect of careful handling shows in the fruit after it reaches the Eastern market, and this is an important factor when the possibility of extending the markets for California grapes are considered. The carefully handled lots only slightly exceeded the commercial limit of soundness five days after arrival while the commercially packed crates were just at the limit or a little above on the day of arrival. Fruit in the one case could be reshipped to smaller markets in less than car load lots, while in the other case it would have to be used quickly. These figures show the same relationship as those found in the season of 1908 and we may be sure that the differences are due wholly to the handling. We have eliminated the other factors by taking fruit from different sections of the district and extending the shipments through the whole season.

An examination of the decayed or moldy berries cut from the various lots shows that fully 95 per cent of the decay started at the pedicel or point where the stem and berry join. This is the weakest point of the grape berry and the slightest crack or loosening at that place will allow the mold spores to gain entrance and start the decay. With the larger fruits it is comparatively easy to detect injuries and to eliminate them; grapes are not only more easily injured but the injuries are more difficult to detect. The necessity for care in handling grapes becomes therefore doubly important, not only in the packing, but in the picking and all handling operations. The handling should be reduced to a minimum, for every time a bunch of grapes is lifted there is liability to injury unless it is done with the utmost care.

It will occur to some that grapes grown under different conditions (soil or otherwise) or from young vines, will vary much in their keeping quality. This is undoubtedly true. Our records, however, are based on shipments made from sandy soil vineyards, from heavy soil vineyards and from old and young vines, and all are included in the tables. We have eliminated to a large extent the effect of these factors. Where fruit is tender and more liable to injury, it must be all the more carefully handled. We have had some lots from old vines show more decay than younger and some heavy land fruit show heavier decay than corresponding lots from sandy soils. Moreover, in our carefully handled series and cork and sawdust packs we have used the same fruit and thus are able to show that even the weaker fruits, carefully handled and uninjured will not decay, other things being the same.

So far we have not referred to the results obtained from the cork and sawdust packs. These were used as a check to determine whether grapes could be handled, packed and shipped in good condition. A glance at the tables and charts shows how well the fruit carried. An average of all the lots packed in cork shows 1.45 per cent decay on arrival and 2.68 per cent, 4.65 per cent, and 5.73 per cent, respectively, three, five and seven days after arrival in New York. The lots packed in redwood sawdust showed much less decay, being only .32 per cent on arrival and .69 per cent, .81 per cent, and 1.20 per cent three, five and seven days after arrival, respectively. Why not change the method of packing? will at once suggest itself to some. But this is not to be recommended until every other means to get the fruit through in sound condition has been exhausted. We believe that the results of our carefully handled shipments show that fruit can be gotten to market in sound condition packed in crates. The markets are accustomed to receiving California grapes in crates and any attempt to change the package or method of packing on a large scale will result in serious objection on the part of the buyers.

We have had one example and warning of this during the season just closed in the way that the general use of the 2-basket crate has been objected to in the Eastern markets. These objections are likely to continue and if the markets insist on a 4-basket package the grapes will have to be packed in that way. It is claimed, and perhaps rightfully, that the 2-basket packs arrived in no better condition than those packed in 4-baskets, and that, besides, the 2-basket packs often were more loosely put up and did not look so well on arrival. We have had a number of 2-basket packs under observation and in many of them we have found as many injured berries and as much decay as in some of the 4-basket packages. The use of the large basket will not of itself correct the trouble, and unless the packer does her share, there is no advantage. However, it can not be doubted that it is easier to pack in the large baskets and there is less liability to break or injure the berries. The packer has a better chance to do good work, and do it more quickly than she has with the 4-baskets; but if she uses care, she can get the grapes into the smaller baskets without serious damage. She will have to be given more time and consequently must not be expected to put up so many crates a day.

A comparison was made in a few shipments of commercially packed 4-basket and 2-basket crates, with the following results: 4-basket crates, 11.30 per cent decay; 2-basket crates, 8.50 per cent decay, on arrival at New York.

These figures show less decay in the 2-basket packages, but both are beyond a reasonable commercial limit on arrival. As in the case of grapes in storage, we have placed 5 per cent as a reasonable commercial limit on arrival. Up to 5 per cent would be considered sound. Above 5 per cent and up to 10 per cent would be noticeable, and above 10 per cent would be fit for only immediate use. More than 15 per cent would not be salable except at a heavy discount.

Table 3 and corresponding chart show the percentages of decay resulting from injuries and the percentages of injured berries found in a number of commercial packs obtained from different growers and held in Lodi in an iced car for about two weeks or the equivalent of a trip across the continent.

TABLE 3.

Average Percentage of Decay from Injuries and Percentages of Injured Berries in Commercial Crates Held in Iced Car at Lodi Same Length of Time as Transcontinental Trip.

	Decay, per cent.	Injuries. per cent.
First day	9.02	12.82
Third day	18.53	8.68
Fifth day	23.52	7.15
Seventh day	29.62	4.21

It will be noticed that the decay and injuries are both high. These crates were not selected with any view to obtaining both carefully and carelessly handled packs. There were perhaps more from packers handling rather carelessly. The figures show strikingly the relation between injuries and decay.

If the percentages of decay and injuries are added together, the figures show from 22 per cent to 34 per cent of the fruit was injured in handling and rendered susceptible to decay. The first day the crates were taken from the car 9.02 per cent was found decayed and in addition 12.82 per cent was injured. At the inspection on the third, fifth and seventh days after taking from the car the decay increased at a tremendous rate, and there was a corresponding decrease in the percentages of injured berries not decayed. This has a very important bearing on the holding qualities of the grapes after arrival, and emphasizes strongly the necessity for preserving the natural resisting properties of the fruit.

It naturally follows that it will cost more to handle carefully—just how much more it is impossible to say, but it will vary with the quality of fruit and the season. But will it pay? many will ask. During a season of low prices, at first sight it may seem unreasonable to advocate the spending of more money on packing. That careful handling will pay, and pay well, has been demonstrated again and again in the orange business. We have seen a number of associations and individuals rise from among the lowest priced class to the highest priced class as soon as more care was used in handling, thereby reducing the susceptibility of their fruit to rot. By increasing the cost of handling a few cents per box, thus insuring sound fruit, has in some cases increased the average returns from 25 to 50 cents per box, leaving out of consideration the value of the reputation thus gained. The question now in the citrus business is not how cheaply can the work be done but how well. It has been recognized that cheapness places a premium on careless work. What is true of citrus fruits will be found equally true with grapes. And if the grape business ever gets to the point where the difference of a few cents per crate spent in good handling becomes the margin of profit or loss, it will cease to be a safe business investment.

The best answer to the question of whether careful handling is practicable or profitable is shown by the fact that a number of growers are handling carefully and are getting good results. When the marketing problems have been systematized, much better results will follow.

Table 4 shows the percentage of decay in individual shipments, arranged in the order of the percentages of decay shown on arrival in the commercial packs. These are the individual shipments from which the general averages have been made. The range is very great, running from less than 1 per cent to over 13 per cent. One shipment went to 24.83 per cent, but this was packed after a rain and most of this loss was due to soft decay, starting on sound berries. The figures shown in No. 6, 3.75 per cent, were obtained from a shipment made from the same place previous to the rains. All the other high percentages were obtained from shipments made before the rain. The percentages of decay in the carefully handled lots of the same fruit placed alongside show that even in the case of the heavy decay found after the rain the carefully handled lot showed less than 2 per cent, or far below the commercial limit above mentioned. This was accomplished by extra care in culling and elimination of all bunches showing excessive decay when picked. These were frequently found to be the tight bunches, and they were always cut apart to determine whether there were any decayed berries hidden in the middle of the bunch.

TABLE 4.

Percentages of Decay in Individual Shipments on Arrival in New York.

	Commercial Pack Crates.	Careful Pack Crates	Packed in Cork Boxes.	Packed in Redwood Sawdust Boxes.
1	0.90	0.17	0.02	0.00
2	1.80	0.70	0.72	0.07
3	2.52	0.50		0.10
4	3.18	0.28	0.18	0.10
5	3.52	1.00	0.10	0.05
6	3.75	1.05		0.11
6 (after rain)	24.83	1.92		
7	5.66	1.33	0.55	0.50
8	6.50	2.41	4.94	0.77
9	9.42	2.05	2.38	0.75
10	13.32	1.95	1.25	1.20

Table 5 and chart show the percentages of decay found on the bottom and top tiers in commercial crates put up by careful packers compared with the commercial pack of packers handling rather carelessly. The figures show that where there is less susceptibility to decay there is not so wide a difference between the bottom and top tiers. The figures for the careful packers are 1.33 per cent on the bottom and 1.84 on the top, while the careless packs show 6.73 per cent on the bottom and 12.10 per cent on the top, or nearly double. These differences are maintained throughout the time the fruit was held, and the rate of increase in the careless packs is very much greater than in the carefully packed crates. These figures were obtained from ordinary crates selected at random from the commercial shipments, and show conclusively the wide variation between good and poor work. When these figures were first shown to one of the shippers at Lodi he at once implored us not to emphasize the difference between the bottom and top tiers too strongly, as he stated he was already having difficulty with some growers who objected to having their fruit placed on the top tiers. The best way to overcome this objection would be to get all the growers into the careful class and then the difference between bottom and top will be reduced to a minimum.

TABLE 5.

Percentages of Decay in Commercial Crates of Tokay Grapes Packed by Careful and Careless Packers. Shipments from Lodi to New York, 1909.

	Commercial Crates by Careful Packers.		Commercial Crates by Careless Packers.	
	Bottom Tier.	Top Tier.	Bottom Tier.	Top Tier.
On arrival	1.33	1.84	6.73	12.10
Three days after arrival	2.21	4.83	10.48	17.28
Five days after arrival	4.33	7.05	14.25	28.93
Seven days after arrival	7.33	9.33	25.18	35.15

The shipping experiments conducted at Lodi were accompanied by a series of local demonstrations, in order that the growers might be able to see the results of the work. A refrigerator car was held at Lodi and kept fully iced during the shipping season. A duplicate of every series shipped to New York was placed in the car and held there until the shipment arrived at destination. The lots were then taken out and placed on exhibition, and the growers were thus enabled to observe the differences found in the different packs. Along with these a number of growers contributed crates from their commercial packs, in order to be able to judge of their appearance on arrival and in some instances to determine the kind of work their packers were doing. This campaign of education among the workers has resulted in a marked general improvement in the commercial pack of the district during the season just closed when compared with the season of 1908. The first year that the work was carried on it was not uncommon to find a large part of the decay due to crushed berries on the top of the pack made in pressing on the cover. During the last season this difficulty was largely overcome by using more care in nailing on the covers and by extra cleating.

Our investigations during the past season show that there is at least one mold which has the power, under certain conditions, to penetrate the unbroken skin of the grape berry. This is a species of *Botrytis*, probably *B. cinera*, and is undoubtedly the cause of the so-called "slip-skin" found after the rains. The "slip-skin" is the early stage of the decay, and unless *every* berry showing this is culled out it will decay, no matter how careful the handling may be done. This disease gives very little trouble before the rains come, but after a rain the crops of many vineyards are practically ruined by it. It is wholly distinct from the cracking of the berries.

It is easy to see that if there were few or no spores of the *Botrytis* when the rain comes, there would be little or no trouble from this decay. This is a pathological problem, and points to the control of the fungus in the vineyard either by spraying or some other remedial treatment of the vines. The life history of this fungus on the vine has not been fully investigated and until it is, it will be impossible to state the exact means for its control. This is a most important phase of the problem, and if the work of the Bureau is continued in California we hope to have a complete pathological study included in the investigations.

In conclusion, it may be stated that the results obtained during the past two seasons are very encouraging. The relation between handling and the occurrence of decay is as striking and consistent as the results of the orange investigations in southern California, which have led to the practical elimination of decay in transit. The indications are that by careful handling in packing, accompanied by some method of quick shipment or cooling, the present losses from decay may be largely avoided. (Applause.)

MR. RIXFORD. I would like to ask the Professor a question. He refers to an importation of the Almeria grape for distribution a good many years ago. I think I was the introducer, about twenty-five years ago. I had a large shipment distributed throughout the State? Do you know how it turns out as a producer?

MR. STUBENRAUCH. We had it under observation at Tulare and packed at that place for five years, including this season. For four years the crops were very good, but this last season the crop was not so good; but the way the vines bore at that place I should say it was a commercial possibility to have good crops, depending on the way they were pruned. I think the only way to find that out is to have a number of experimental plots in different sections and to actually study the method of handling that grape in California. We could establish experimental plots in different sections and have the pruning and other cultural requirements studied in that way, and I am hoping to have the Government take that up. I think it is so important, because there isn't anything like it; we have nothing like that grape under our observation. I think if we had that grape growing in California we could get that splendid trade.

MR. RIXFORD. R. B. Flowers, to whom I sent the cutting, grafted them into other varieties, and he reported them as shy bearers.

MR. STUBENRAUCH. As near as I can find out, it was a very shy bearer, but they had been pruning them in the old way, and, of course, probably they won't grow in every section. It is a late grape, comes along with the Emperor and even later, but it is certainly worthy of a very careful study.

A MEMBER. Where can we get cuttings?

MR. STUBENRAUCH. I think the station at Tulare has been abandoned, but another plot has been established at Fresno.

MR. ASHLEY. You can get some from Frank Swett.

MR. STUBENRAUCH. Yes, and George Roeding has a few.

MR. HARTRANFT. I live in a very late district, and we are still hauling in grapes. You say it is a very late grape, and probably in such a late district, on the north slopes of some hills where the shadow comes about half-past one or two o'clock in the afternoon, I think perhaps it might be well to try them out.

MR. STUBENRAUCH. But try the long pruning and trellising.

MR. WALTON. In your remarks you said there seemed to be no way of determining when grapes were ripe and ready to pack and ship. Is it not possible chemically or some way to determine when grapes are ripe? I notice in the East, when grapes are received there, the market is destroyed by immature shipments in each variety.

MR. STUBENRAUCH. You might determine the percentage of sugar but that does not really tell you when the grape is ripe; it only tells you how sweet it is. I think the only way to get at that point would be to make a number of experiments, taking the grapes from the vines at different stages of maturity, starting purposely with green grapes, taking their sugar content and then continuing from week to week or from day to day, even, but that would not give you the actual time the grapes were ripe but would give you the most favorable percentage of sugar. It is especially hard to say that this grape is ripe. Color, for instance, can not be relied upon to determine that point. We have the Tokay at Tulare very, very poorly colored, yet the percentage of sugar was high enough.

MR. ASHLEY. That would vary greatly in a few miles. For instance, in the Lodi country the black land is three or four weeks behind the sandy land, only three or four miles apart.

MR. STUBENRAUCH. Oh, yes, it would vary in short distances. That would have to be worked out in typical localities. I think that is an important point. I was speaking with Mr. McKevitt about that last night. If we had some definite figures to fall back on I think we would be able to hold back shippers to a large extent and probably prevent the shipping out of that green fruit. I have seen some of the green grapes shipped and they are absolutely worthless. In the Imperial section they grow the Marquette and it ripens six weeks ahead of anything in the San Joaquin Valley. They are not satisfied with that and want to pack two weeks earlier. You might as well eat vinegar as that fruit.

MR. STEPHENS. The expression of "top tiers," what do you mean?

MR. STUBENRAUCH. In the car. The grapes are shipped loaded nine high. The bottom tier refers to the floor and the other, the ninth one, on top. That is the way it was done.

MR. STEPHENS. That is very important, because if the tonnage should be raised it would naturally raise the tiers and consequently the top tiers would be more affected than the bottom tiers.

MR. STUBENRAUCH. Yes, depending on the installation of the car. If you could start with cold fruit you won't have so much trouble. That was shown in the orange work in southern California. We were able to load three tiers in the car and not hurting the fruit at all, by starting with cold fruit. We put 549 boxes in some of those cars by putting in three tiers.

PRESIDENT JEFFREY. Now we will hear from Mr. Brown, of the University, who will present a paper, "The Horticultural Work at the University Farm, its Aims and Objects." Mr. Brown is Professor Clarke's assistant in horticulture at the University Farm.

THE HORTICULTURAL WORK AT THE UNIVERSITY FARM.

By B. S. BROWN, University Farm.

Before taking up the discussion of the horticultural work at the University Farm, it would seem best to spend a few minutes in explaining just what this farm is, and some of its more general attributes.

The farm proper consists of 780 acres of land and is situated in the town of Davis, thirteen miles west of Sacramento. All of this land is subject to irrigation, and its splendid fertility affords an excellent opportunity to carry on all kinds of farm operations or experiments. The purpose of this farm can, perhaps, be best explained by quoting a part of the statutes establishing it. In the acts of the California legislature of 1905, chapter CXXIX (129), reads in part as follows: "The University Farm and the instruction thereon shall be so conducted as to meet the needs of persons who desire instruction in agriculture, horticulture, viticulture, animal industry, dairying, irrigation and poultry raising, and to prepare them for the pursuit thereof; and shall be used for experimental and investigational work in connection with the Agricultural Experiment Station of the University of California. Short courses of instruction shall also be arranged for in each of the leading branches of agricultural industry, so regulated as to provide for popular attendance and general instruction in agricultural practice."

From the above it will be seen that the main objects of the farm are: first, to carry on investigational work, and second, to provide instruction in various agricultural subjects.

To turn now to the horticultural phase of the work at the University Farm, let us first consider the educational side. For some years past in this State there has been an ever growing feeling among the farming class that the long period of years required by the University for an agricultural education could not serve their best interests. The four years in the high school followed by the four years in college was too long a time to keep the young man away from the farm, besides creating in him a desire to remain away. To avoid this, a three-year course, for which a high school training is not necessary, has been established at the farm, which aims to give the boy a thorough training in agriculture. At present this school is in but the second year of its work, and although many rough places still remain to be smoothed out, yet on the whole results are very encouraging. In horticulture the work so far has been confined to tree fruits. But in this we have tried to give the boys a thorough working knowledge of the subject, such as the selection of sites and soils for the various fruits, preparation and planting of the young trees, the various cultural methods necessary, irrigation, etc. Pruning in its various phases is taken up. The harvesting and handling of fruit is carefully considered, and the various marketing processes are followed until the goods are in the hands of the consumer. Each boy is instructed in the work of the nursery. He is taught how to propagate orchard trees, and the actual work of budding and grafting is done until the hands have been trained to do what the mind has been taught to understand.

Another feature of the educational work at the farm is the short course in horticulture. We now have under construction a $20,000 horticultural building. When this is completed we will have abundant facilities to offer short courses in this subject. These are primarily for the busy farmer. One who can spare but two or three weeks from his work. Here he gets in touch with other people and sees what they are doing. He is able to follow the experiments carried on by the farm, all of which help him to keep up to date. Problems and troubles of the farmer are discussed and remedies suggested, and instruction in the more general problems are given by the men from the University. With our new equipment, together with the hearty coöperation of the people of the State, we hope that much good will result from these short courses.

Turning now to the investigational phase of the work, which, I presume, to you people is the more interesting, let us see what the University Farm is doing to help solve the problems of the agriculturist. How can the farm benefit those who have passed beyond the time and reach of the high school or college? California is a big state, and farming in it is done under more varying conditions than any other state in the Union. Our climate varies from that of the tropics in the south to perpetual snow in the north. Our moisture conditions vary from those of the barren desert to that of almost continual rain. It is very apparent, then, that under these many different conditions that advice that would hold for one section of the State would probably be inapplicable for another. Hence, the need of the various experiment stations. California, more, perhaps than any other state, has an unlimited field for research work. So many new things to be tried, so many problems to be solved that at present our answers to questions are few and far from satisfactory. The University Farm, as best it can, is trying to fit into the conditions of the great Sacramento Valley. A great fertile country, larger than many of the Eastern States, capable of supporting more than twenty times its present population, yet but little known or understood.

At the present time the horticultural department has a number of experiments under way; twenty acres have already been planted to standard varieties of deciduous fruit. Among these we have 12 varieties of almonds, 6 of pears, 12 of apples, 18 of plums, 5 of prunes, 5 of cherries, 9 of apricots, and 80 of peaches. These are all to be tested out under valley conditions. Their amenability to different treatments of pruning, of methods of culture, and of irrigation are to be watched, that we may give more specific answers to the many inquiries.

One of the special problems which is now being studied is that of the almond. In many sections of the valley this particular crop is a failure, and no one seems to know why. Some say it is due to early blossoming and frost, other to the lack of cross-pollenization, etc. We are trying by the application of scientific methods to find a cause. We need to watch the flowers of these trees to see if they are perfect, we need to examine the pollen to find out if it is carried by wind of by insects, and if by insects, what particular one is responsible. We need to know the length of time these flowers are open, and their susceptibility to temperature and moisture. We must find out if they are self-fertile, or if they must receive pollen from another tree, as many other plants do. We must also find out whether they will grow best upon their own root or upon their near relatives, the peach, plum, or apricot. And if there is a difference, to what soil each particular root is adapted. All of these questions and many more we are now asking of the almond tree. I simply mention these to indicate what the plant men of the experiment station are supposed to know.

Along these same lines Professor Bioletti is carrying on experiments with the grapes. He has twenty acres which he is preparing to turn into an experimental vineyard. All of the different types of table and wine grapes are being grown to determine their suitability to valley conditions. Different varieties of the European grapes are being grafted on to the many different species of the native stock to see if they will make a good union and strong, vigorous plant. At the same time a careful watch is kept for their resistance to phylloxera and attacks of mildew. At present about 20,000 grafts are being made, dealings with fifty different varieties of grapes on twelve or fifteen different kinds of roots.

This outlines in a very brief way the horticultural conditions as they exist at present at the University Farm. As we look over the conditions of the valley and plan for future work, we find an almost unlimited field. For example, take the apple. It doesn't do well in the valley, and to the many questions why, our answers are far from satisfactory. The high summer temperature forces the fruit to early maturity. The fine apple flavor does not develop and their keeping qualities are impaired. We need a good apple for the Sacramento Valley. Not only one good to the taste, but also of good keeping and shipping qualities. We hope to do something with this by a series of experiments lasting perhaps ten years.

Just now word comes to us that the olive men are in trouble. The pure food law prevents them from using artificial coloring in pickling, and the many-shaded product now put on the market is spoiling the trade. We need to help these people out by producing an olive with less bitter and a more uniform coloring, that the California product may compete with that of Europe on the open market.

Further, we believe it a part of experiment station's work to try out all the new varieties of fruit offered by the various nursery companies that we may be able to advise of their adaptability to valley conditions, as well as to protect the farmers from fakers. New plants from other states or countries should be tried by the experiment station, and records kept of their probable value. Novelties and tropical plants, such as the vanilla bean, tea, coffee, tobacco, and cotton, which at present have no commercial value with us, should be tried out, if for no other reason than that we may be able to properly answer the questions of those seeking information.

Still further, owing to the lack of a forestry department at the University, the horticultural department at Davis is experimenting with eucalyptus. A few hundred trees are being tried out in connection with our sewage disposal plant, and also of a few variety tests are being made. Of course, we can but inadequately meet these requirements, but it seems that a subject carrying such a widespread interest throughout the State as eucalyptus does should be officially represented by the University, and we believe that it is not too much to hope that in the near future the University Farm will have a department of forestry to represent the State's leading commercial industry.

From the educational side at the University Farm, we are predicting great things for the future students in horticulture. Instead of the one-year course in pomology we hope to offer four courses, with as many more in allied branches of horticulture. At the present time the successful orchardist must know how to spray, so we must introduce a course to cover this need. Bush fruits offer a new field for the Sacramento Valley farmer. So our school schedule ought to be enlarged to include these. Floriculture needs to be given, that the coming farmer may know how to grow, to care for, and appreciate the beautiful flowers for which California is famous. In these days of country-life commissions and agricultural high schools, rural art and home decoration must be brought in prominence that *real homes* may be built and their occupants made contented by the knowledge that they have the best there is.

The efforts in horticulture at the farm should not be devoted altogether to question of production. Although the producing of bigger fruits, of finer quality and flavor is important, yet we believe that it is just as important to know that this same fruit is placed in the hands of the consumer in a clean, wholesome condition. We believe in organization among the farming class, and we think the young student should be trained along these lines in school, so that when he gets out and comes in contact with the actual problems of life he will have the equipment and training necessary to become a leader.

We might continue to add to this list, but this will suffice to show the responsibilities the University Farm has undertaken. Whether it will prove a success or not rests largely with the ones who patronize it and the support of the people of the State. We believe that the University Farm has a great opportunity before it, and we hope that it will get your hearty coöperation and that the agricultural education of California may be brought up to the standard to which it deserves. (Applause.)

PRESIDENT JEFFREY. I would like to call attention to one particular part of Mr. Brown's address for you to consider, that is, the reference to the economical part of it. When I was over at the University Farm a few weeks ago talking to these same boys, of which Mr. Volck is a sample of what they turn out from the higher department of the University agricultural school. I asked those boys if they knew how far the Southern Pacific Railroad Company had to lift a car load of peaches to get it to market. I didn't expect them to answer it; there isn't a man in the house can answer it, but the boys had never thought of that question. In taking a car load of sugar from New Orleans to Chicago they have to lift it 200 or 300 feet. In taking a car load of peaches from California to Chicago they have to lift it 7.3 miles straight up. Now, that is a matter of economics, and is very important. Fifteen years ago the average freight train was hauling only 143 tons of freight. To-day the same crew of men, so many brakemen, conductor, engineer and fireman, are handling nearly 400 tons of freight. The first proposition I named is in favor of the railroads. They can't carry freight 2,300 miles and lift it 7.3 miles as cheaply as they can carry it a few hundred miles and lift it 300 feet. On the other hand, the railroad that is now able to carry 400 tons of freight with the same crew of men that formerly could only carry 143 tons should reduce their rates. That is in favor of the fruit grower. I asked the boys of they knew that the producer of a perishable product had to take all the risk of taking it to the market, whether he sold the crop on his trees or whether he sold it on consignment or in what way. The boys had no thought of that. It is a good thing for all of us to think of. Now, what I object to in the University course at Davis and also at the University itself is, that they have no chair of agricultural economics. They have an economic department there, and each one of seven or eight professors there signs after his name, "Professor of Commerce," and the word "commerce" means to the average person the mere handling and shipping and traffic in freights. You go to a commercial school in any city in this State and you will see them doing all their figuring and warehousing and banking and insurance and brokerage, but they don't do any figuring in selling hay or peaches. They teach the boys at the school what they call commercial subjects. It is no more commercial than Mr. Judd's selling his apples. I have talked this over with Professor Wickson. He agrees with me that the University should have a chair of farm economics, and when you people realize this you will get it. I think the University ought to give it to you without any demand. Professor Wickson says it will come when the farmers demand it. When you send your boys to be educated as farmers, see where they are denied the right to learn how to sell the products they raise. We have too long considered farming as a mere function, as a mere occupation, that is, the producing of a certain tonnage of fruit and we have forgotten to teach the farmers that there is a business end of it. As I told the boys at that meeting at Davis, the business part of farming may be entirely different from the productive part. So is my right hand different from my left. Will any one in this room deny that I need both of those hands? Sometimes my very life may be dependent on my having two hands. They are different: one is right and the other is left. Just as selling farm produce differs from raising it, and yet I must have both of those if I am to make a success. I believe the very life of farming will soon come to the point where the farmer must be as good a business man as he is a producer. I believe we will come to the point very soon that the man who shall teach another man how to raise more fruit without teaching him how to sell it is a disadvantage to the State. In other words, the University must come to the point of teaching the boys just as thoroughly how to sell the products as they do to raise them. The Southern Pacific Railroad knows everything about fruit growing that relates to railroading. The farmer should know everything about railroading that relates to fruit growing, and until he learns these things he is at a disadvantage and will get the worst of it. (Applause.)

MR. DARGITZ. Teach them to raise better instead of more fruit.

PRESIDENT JEFFREY. Mr. Dargitz has the key to it, and that is what Professor Clarke is doing. And at the same time teach them how to get the money out of that fruit. If Mr. Dargitz were raising almonds just for the fun of taking his friends around to show the good crop, he would not need to know the business. If he need to get his wife a pair of shoes occasionally he needs to know how to sell those almonds. Mr. Ellery is here and would like to read his paper before noon. We will hear that delightful paper on roads from a man who is not afraid to face the music on a good many things besides roads. (Applause.)

BETTER STATE ROADS.

By NATHANIEL ELLERY, State Engineer.

MR. ELLERY. *Mr. Chairman, Ladies and Gentlemen:* In 1893 the State of New Jersey began a state-wide agitation of the road question. They enacted a law known as the State Aid Law. It was a pioneer along this line. They had taken their cue from European management and control of roads. After the State of New Jersey had gone but a year or two on that line other states adopted the plan, and it became, in the Eastern States, quite universal. Since 1893 there have been several minor changes in the law, and recently the State of Pennsylvania, which is spending some millions of dollars in the construction of state aided roads, has been figuring more along the line of getting a system of state roads aside from the state aided roads. We know that in the State of New York, where perhaps the state aid has been extended more than in any other state, about one hundred and sixteen millions of dollars are being expended on state aided roads. I mean by that the county spends perhaps one half and the state one half. The great question with these state roads is not merely in the construction of them, but it is in the maintenance after you get the road constructed. I have seen in the State of New York good roads constructed, and I have seen those same roads in a very few years deteriorate until they were—well, some of the worst roads in the State. If, after those roads had been constructed, you would put on a system of maintenance to care for them, then you would have good roads and would enjoy the benefits of them all the time. There, where it took about five years for them to detoriate, you would have had the benefits for those five years, and if the maintenance kept up you would have probably everlasting benefits from roads. This question of maintenance has been taken up benefits from these roads. This question of maintenance has been taken up pretty thoroughly by the State of Massachusetts, which has a system of state roads, as a number of the other states have. I might explain the roads more than the construction of roads. The aid plan is worked something like this. The state provides for one half of the cost of construction, in coöperation with the county which provides for the other half, or a percentage. In New York State they provide for one half each. In the State of New Jersey it is provided as follows: the state one third, the county one third, and either the general road fund or the property owners who are benefited by the road or the construction or improvement of the road, pay the other third. In the State of New York it is partially paid by the county and partially paid by the people who are benefited by the improvement. After this road is completed, it is turned over to the county for maintenance. You will notice that right here is an important point. The county takes the road and is then held to certain rules and regulations by the state, and it must follow out the maintenance in accordance with those rules or regulations or else the state steps in and spends the money to keep it in such shape as they deem proper. That, in a general way, is the state aid system, but, as I said a little while ago, the State of Pennsylvania has been figuring out that they want a state system. They want some roads controlled and maintained by the state.

The State of California, at the last session of the legislature, passed an act for the bonding of the State for eighteen millions of dollars for a state system of roads. That seems to be the latest development in the East. This State desires to bond for eighteen millions to construct the roads to tie up the various county seats of the State, then the counties to take up and construct the secondary roads, perhaps somewhat after the manner of the state road. The state road would be used as an object lesson or example by which the county would work out its minor roads. The question naturally arises, whom do those roads connecting the county seats benefit? As an educational proposition they benefit every one. As tying up the county seats they benefit every one. As a matter of maintenance they will vastly benefit every one, because at the present time in the State of California we have practically no maintenance. On our approximately 55,000 miles of roads in the State of California, I dare say there is but very little maintenance, although we expend per annum three and one half millions of dollars upon these roads. In the past ten years if we had taken half of the three and one half millions we would have had about eighteen million dollars to put in permanent improvement. To be sure, we have got to spend part of this money in keeping the roads up.

There is another item in the State taking hold of the roads. We want to get those roads away from local influences. When there is a dollar expended on those roads we want that dollar to show, and the only way we can get away from local influence is to take it out of the hands or partially out of the hands of those who meet their fellow citizens and say, "Hello, Bill," or "Hello, Jack," and the man goes out to fix up the road and the supervisor says, "Well, you have got a couple of boys with teams; take them out on the road." That man is spending the county's money. He ought to put in the full time on the road. He ought to see that the county gets its money's worth. It is to his interest to see that, but there are certain local influences that tend to stop that. We want to get away, if we can, from these local influences, and the farther we go the nearer we get to the State where we will certainly get away from some of them.

Again, the State, in constructing these roads, can employ good engineers, can adopt a system of maintenance that perhaps the county can not take up, perhaps for political reasons, or for other reasons, as lack of funds. Some sort of scheme will be evolved, perhaps on the European plan, of giving a man a section of road and let him care for that. Not to give him too much road, but let him look after his portion and see that it is kept up. Then the system of rewards that they have in Europe might be a good thing, reward the man who does the best work on a certain section of read. That would be an incentive for a man to work a little harder.

We have seen the failure in the State of the roads, from the use of oil. Most people, I should say, in the State say that oil is a bad thing. I don't condemn it, because I know how it has been used. I believe to-day if it had proper application and proper attention after it had been applied—and by proper attention I mean the strictest kind of maintenance—the oiled road would make a good road and make a cheap road. I have seen a dirt oiled road kept up in such shape that it was as smooth as this floor. I have seen that same road, after the supervisor went out of office and another man took it up, in a year and a half, go to pieces so that it was no better than the ordinary rutty, muddy road that we see so often.

There is another question that comes in that makes me believe we should take hold of this thing; the city should pay its part, as they do under the aid plan or as they would do under any state plan. I think in the rural or country districts of the State we need to make the conditions better. I sincerely and earnestly believe that we want to retain the young man and the young woman on the farm, and if we want to retain them there we have got to make something attractive to them, and a road is a part of the scheme of giving them attraction, and I believe with good roads that it will help in holding a great many of the young people on the farm. I think this is a very, very important factor.

I have spoken to you of the maintenance of roads. I want you to get that clearly in your mind. We have various sorts of roads, different kinds of construction, but we have no system of maintenance. You know that any piece of construction, no matter what it may be, if it is a house it needs painting after a while, if it is any sort of work it must be cared for, and with the road, above every other kind of construction, it receives the severest test; it should be cared for most carefully, for it you don't care for it you are bound to get bad results.

Now, as to the question of bonds in the various counties. The people are bonding and putting the money in the hands of a commission, and that commission, after the construction of the road, turns it over to the supervisors for maintenance. What the bond issue by the State for eighteen million contemplates is this, that if the county, under the bond issue, is built up to a certain standard, then the State would assume or take it over and pay the county and then maintain that road. That is what is contemplated in that issue. By roads I mean the main roads between the county seats. This scheme, therefore, allows the county to build its roads, but when it comes to the maintenance, which is the important factor in the road problem, then the State takes hold of it and maintains that road, and I sincerely believe that the maintenance of the principal roads can be better handled by the State than it can by the system we have at present. The states that have the state aid plan in the East have gone through the same experiences that we have gone through, and they are getting out of the rut, they are getting good roads; and the State of California, above any other state in the Union, should have good roads, because it is the great fruit raising state, it is the great scenic spot, you might say, of the world. You are spending in the State of California to-day something like fifty or sixty million dollars to haul your products just to the railroad station. If you put your roads in a proper system of construction and maintenance and look after them properly you can cut this expense in half. If you do that you have saved that much money, but you have not only saved it that way, you have given the country district something that they want. Not only that, but I dare say that with the good roads you will hold in check excessive freight rates. It may be forcing the thing a little, but the time may come, if we had smooth, good and dustless roads, that you may have some kind of transportation outside of railroads. You may have motors, and instead of about 5½ miles, the average haul now, you may be hauling 20 miles; you may make the railroads come to an economical basis of fixing rates. If with these roads you can preserve your fruit or keep it from being spoiled by the jolts, the price that you get for it is higher. I have watched grapes being hauled to market over the rough roads; I have watched different classes of fruit being hauled, and I have known any number of instances where that product has been badly damaged simply on account of bad roads.

I do not think there is any more important subject to us than this. The roads are a public institution, and they should be handled and looked after the same as a private business should be handled and looked after. The money expended upon them should be handled as economically as a private business. You don't see your great transportation companies, the railroads, employing various men to run the railroad business. For the construction and maintenance of these roads you see trained men, you see high class engineers, and some of the railroads, among them the Pennsylvania system, employ engineers who are really or practically in charge of the railroad. Now, it requires just as good an engineer to build a highway as it does a railroad, and it requires just as good an engineer to maintain a highway as it does a railroad.

If you leave the roads or highways, then, to untrained men, inexperienced men, you can't expect anything but poor roads; you have got to get them into the hands of trained people, and I think that through a state plan this matter will be solved and the roads will be put upon a proper footing. Understand me, I mean that the technical part of the road work should be in trained, technical hands, and the business part should be by good business men or men of large executive ability. We see to-day, for instance, where there is a good man elected supervisor who looks after his roads. Perhaps he has done something that has not quite suited his constituency; at the end of four years they put him out and another man is put in. How can you ever expect to get a system worked out in this way? I don't doubt but a great many of you here have seen this, that one man in charge of a piece of road had his views and ideas about the construction, and he went to work to carry them out. When the change took place and the other fellow came in, his views and ideas were diametrically opposed to his predecessor's, and he fixed it upon in his way, and the next fellow probably did the same thing, and instead of getting roads you got a hodge-podge out of it. As I have said, it requires considerable scientific ability to get these roads on a proper footing, and I think that the roads require engineers just as much as any disease requires the man of medicine. I don't think if you were ill at home you would go to a blacksmith to have him cure you. If you are going to get a road, I believe you will have to go to the engineer to get it.

In this bond proposition of eighteen millions of dollars, stop and think what it means; stop and think, by tying up the county seats, what it means. Again, stop and think what the opening up of the great Sierra Nevadas of this State means. You know that the southern part of the State has a great harvest, not only of oranges and lemons, but tourists. Those people can be induced to stay longer and spend more money if you give them good roads up through the Sierra Nevadas. They come out here to the coast with their machines, and they spend their money whenever they do that. I have been in the hotels and heard them say, "Well, there is no good of coming out here again." They can't go anywhere, owing to the mud and dirt and bad roads, yet if we had good clean roads for them to travel on they would not stop in that section, but they would travel over this beautiful country. That alone is a very important item. In the expenditure by the State of eighteen millions, just see how small it is compared with what we are now spending. Look at the past thirty years and see what we have expended on roads. We have expended alone on oiled roads some millions of dollars, and where has it gone? There isn't much of it left. I dare say that in the past thirty years the State of California, through its counties, has expended something in the neighborhood of sixty millions of dollars for its roads. If we can stop this and put a system into use and get it going and spend only eighteen million dollars for that system, and see to it that the money is put out properly and expended only on the roads, I think that the people of this State would all be for it, because it means as much to the State of California as any one thing that I know of. (Applause.)

PRESIDENT JEFFREY. I would like to ask one question, Mr. Ellery. If the people of the State of California could be assured that we would have good engineering for the next four, eight or twelve years, they would vote for eighteen million dollars right straight down the line. How can they be assured that they will get their money's worth?

MR. ELLERY. In answer to that, we are not assured of much of anything in this world, but the present system is totally inadequate for our needs, it does not solve the problem, and if the problem is not solved by our present ways you have got to turn to some other scheme. I do say this, that what we need in office are men who will properly handle it, but that I can't guarantee.

MR. HARTRANFT. We had some experience in that down in Los Angeles, and I believe there is an ideal way of getting at those people. We voted over three million dollars in bonds for good roads. We have the best system of municipal government that exists on the face of the earth, and have recently found it out, but we have not got the same form of government in the county, and we voted three million dollars in bonds; they sold part of it; they put up a job in the selling of them through a private sale; we stopped them in the court, and the solid three have gone on and done about enough work to-day to amount in its total construction cost about half what the interest is on the bonds sold. To take the precautions, to get the money spent properly on the roads, which everybody was for, and the proposition carried by about four votes to one in favor, if it appointed a business man's advising board and a great engineering board and all the schemes that you could appeal to the voters, and then instead of having the power to force through the program as laid out, the entire will of the people and the entire intentions have been thwarted by the powers of the elected supervisors, because there is no form of government by which they can be reached until an election under the old plan, and southern California, I know from personal contact, is not for the state bond issue, although I am for the building of good roads everywhere, but southern California is not for it. We are going first to get a proper form of government so we can do it, and I met on the railroad coming up here one of the fine political bosses in the south, and he said, "When you meet any of those machine fellows over in Watsonville tell them they licked the stuffing out of us in Los Angeles, and they are all headed for Sacramento and they are headed there for direct legislation," and I think we have had in this convention before resolutions for the initiative, the referendum, and the recall. If it isn't out of order, I move that that is the sentiments of this convention. (Applause.)

PRESIDENT JEFFREY. We are under great obligations to the State Engineer for the able address he has made to us to-day. It has been illuminating and instructive and encouraging, and in behalf of the members here I thank him, both as a friend and as an official, for coming here to-day. He speaks with authority, he is a man of courage, a man of incorruptible honesty, and if he could build our roads for us there would be no question about the money.

PRESIDENT JEFFREY. The next paper will be by Mr. Frank Femmons of Ahwahnee, Madera County. Mr. Femmons is one of the pioneer apple growers of the high Sierras.

SOME OBSERVED CHANGES IN FRUIT TYPES.

By FRANK FEMMONS of Ahwahnee.

In presenting the following observations that have reached over many years of association with trees and plants, I wish to disclaim any scientific attainment, or that they are entirely new to our scientific horticulturists. They may all be but simple things as most of the operations of nature are found to be when we once understand them; and, also, valuable in our work in orchard or garden.

I feel sure there are many operations in nature that contribute to producing changes in plant life; giving the plants their individual form and character and to their fruits their peculiar color, texture and flavors, often to the extent of producing new varieties, that are not as yet fully understood.

We have learned something about crossing and hybridizing, but with even our Burbank, the process is far from certain in its results. There must be other natural influences that we know little or nothing about that are constantly modifying the results of our best efforts. Some of these, as that of heredity, we know something of, but as yet have little power to modify. The influences of environment are more under our control. But do we yet know all the elements and accidental combinations that may have their influences in what we call environment or local conditions, to modify plants or their fruits? In a rough way we know many and can modify and control them, but I think we have evidence in our every day practical experience and observations that we have not mastered all. Where did the old Rambo, the White Winter Pearmain, the Delicious, or any of our apples get their peculiar flavors and characteristics? It is easy to ask such and a thousand other questions that will start some theory in the mind, but I am not able to answer them. The facts of observation here referred to as illustrations, are, I think, of a class that gives an evidence of some operations in nature that are not entirely understood. Similar facts may not be new or unheard of to our scientific people, but I have not seen them referred to, not explained in our common horticultural literature.

For five or six years past I have been watching a change that has affected some Black Ben apples at Home Orchard. I wish to make the statement of the observed facts as full and accurate as I can.

In different parts of the orchard are many top-grafted trees of it, and on many different varieties as stock. As it happened, several trees regrafted were near some of the old Ben Davis of which Black Ben is a seedling. The Black Ben has a solid red color, while the Ben Davis, as every one knows, is prominently striped. The first year the new trees immediately near by, or in the next row to the Ben Davis bore fruit, I noticed that many of the apples were very noticeably striped. The evident fact was a puzzle to me, and besides some of the fruit had its typical color. The next year the change was more pronounced, and I wrote something of it to a horticultural friend in the East. He thought the only explanation of it was that "the scions used had been mixed." That didn't satisfy me, and I have been watching it ever since.

While at first the change was confined to the trees near the Ben Davis (24 feet apart), it has extended out year by year until the past season it was plainly noticeable *five rows distant*. Beyond that, and in other parts of the orchard where Black Bens are fruiting near other varieties such as Lawver, York, Imperial, and others, the color is entirely unchanged. Except in color, I can see no other change—size, form, quality and the peculiar shape and modeling about the eye-basin are all typical Black Ben.

Some years ago I had an observation that I think in the same line. I had planted two patches of potatoes. They just cornered with each other. One was planted some days before the other. As seed potatoes were scarce that year they were both cut to "single eyes." One was a red potato we used to know as "Garnet," the other was similar in size and form, but white. They both made fine growth and yield. When they were ripe and dug the hills at the contiguous corners were about *equally filled with both the white and red* and the mixture extended for a number of hills into each patch. Beyond that they were all typical of the variety planted.

Another experience in potato growing. Some years ago I sent East for a small quantity of what was called "White Elephant." It was planted in the garden along side of some Early Rose. When they were dug but few of them were of their typical white color—and were evidently mixed with the Rose. Some of them were uniformly of the Rose color; some were mottled in splotches and bands of red and white, while a part of them retained their original type. They were all planted the next year but the crop had lost all its character.

Benjamin Breckman of Illinois claims that this mixing of the tubers when different varieties are planted near each other is the true cause of potatoes "running out" and becoming worthless, which coincides with my own experience and observation.

But how do the tubers mix? Does the influence in the case of the Black Ben apples and in that of the potatoes come through the pollen? The Early Rose so very seldom form a bloom, that in the example of the White Elephant it would favor a doubt of that conclusion. We can understand, or at least know the fact that the pollen of one variety greatly influences the true seed germ of another. Has it some power, also, that we do not fully understand; or is the change produced by a subtile diffusion of some hereditary relationship that under certain conditions reaches back to some influence or association of former generations, or a common origin?

Two or three years ago, among some yellow speckled beans at gathering time, I was surprised to find some white ones. There has certainly been none of that color in the ones planted and no other growing on the place. In shelling out some scattered pods by hand, I found two, one with a single white bean near the middle, and in the other, two white beans with a yellow one between, the others in the pods were all the same as planted; all the individual white one seemed perfect to their type. We are apt in our ignorance of the true cause to call such things "bud variations," "freaks," and "sports," as though nature had momentarily forgotten herself and allowed some new creation to creep into her household by chance.

There is another class of fruit variations—the influence of the stock upon the scion, that is recognized in a general way, but I think the influence is often greater than supposed. It may be for the better in some characteristic, or, as is more usually the fact, for the worse.

In all my top-grafting (and I have done a good deal of it) I have always been careful to cut scions from the tree that produced the finest fruit of its variety, growth and all other characters considered. With some varieties but little change is noticeable, but in others the influence of the stock is often considerable, and I feel like taking the Delicious as an example. In the orchard are about one hundred top-grafted trees of that variety bearing, and the scions were all from a single tree. Of the tree propagated from it, a few are certainly highly colored, better in form and more juicy—finer apples in every way. Others are a dingy, pale color; some more elongated; some are inferior in quality; in fact, scarcely two trees bear fruits that are identical in all their characteristics. In most of the trees, however, the change is very slight. From my observation and experience I think the Delicious very susceptible to this influence; that is, particular in its associations as an apple of its high character has a right to be, for it certainly is the "Queen of its Kind."

I will give another example in the same line: A neighbor who planted one of the oldest orchards in this mountain section, found his old Grindstone (American Pippin) of little value, and about twenty years ago (the trees were about thirty years old) top-grafted them from a fine strain of Ben Davis. When they came into bearing, the fruit was neither Ben Davis nor Grindstone. It seemed to partake of the characteristic of both, but so blended that no one not knowing the facts could tell what it was. It had the flattish, round form of the Grindstone with the brighter stripes of the Ben Davis, only medium in size and worthless in quality. That was the most evident and best example of the influence of stock upon scion I have ever seen.

We explain such changes as the congeniality of stock to scion. But what is it, and how is it produced? What modifies the plant's organization that makes one of the same species congenial, and the other not?

There is another class of fruit changes that we are likely to hear more of in a scientific way in the near future. The modifications of many varieties of fruits by our Pacific coast influences have attracted attention for many years. We all recognize the fact, but I think it has not as yet so fixed our thought and investigation as its importance deserves. Many varieties of apples when grown here are scarcely recognizable when compared with the same as grown in their old habitat of the Eastern States. Our soil and climatic influences seem to develop some of the varieties into almost new and greater forms. Many of our local seedlings seem to have something inherent in their character that is *distinctly Western*. Besides our favorable natural conditions, I think, the converging and commingling of all the different types that have been heretofore comparatively isolated is producing varieties that in development will give us new and higher types of all our fruits.

I know that such observed facts in nature, and that we meet only once in a while, leads off into a line of speculation I am not scientific enough to explain or give them any particular application. All the natural laws and their operation we know contribute to the development and comfort of life. We have no reason to think that the more obscure ones, when better known and under our control, will prove any the less useful. With all the accumulated knowledge that has come to us out of the wisdom of the ages, we have no reason to think we have fathomed its depths. Nor do we know how much the still unknown secrets of nature when mastered will contribute, if rightly used, to the power and welfare of the human race.

I am sure there are no lines of research into the still unknown fields of science that promise so great a reward as in that of horticulture—the propagation, care, and development of plants and their fruits. No other production of nature contributes so much, and directly to the physical life and welfare of mankind, and I can conceive of no limit to their future development and usefulness, nor of any ultimate knowledge of all the resources of nature that may contribute to that development.

PRESIDENT JEFFREY. We will now be favored with a paper on eucalyptus by our State Forester, Mr. Lull.

EUCALYPTUS COMMERCIALLY CONSIDERED.

By G. B. LULL, State Forester.

It is of great importance just at this time that reliable information on the subject of growing eucalypts in California be given to the public. Persistent reports of the impending failure of the Nation's hardwood supply, together with a growing belief that the future demand will be met, to a large extent, by California-grown eucalypts, have already induced hundreds of persons to establish plantations and thousands to buy stock or acreage of them, in order to take advantage of this market. Many more will doubtless become interested during the next few years. Inasmuch as many purchasers of stock or acreage in eucalyptus companies are residents in Eastern States, their only chance of judging whether the claims of promoters are correct is by correspondence or through reading the publications of the State and Federal forest offices on this subject.

There can be no doubt that, rightly undertaken, eucalyptus growing is a sound, conservative business, of a sort to be encouraged. It promises to be of the highest value, not only to this State, but to the country as a whole, for the prevention of a hardwood famine is a matter of national concern. It is, however, of special interest to the State, for if the eucalypts become the principal hardwoods in use it means a shifting of the source of supply from the East to California and the removal hither of most of the woodworking plants depending on it. California will then furnish to the country not only the raw material, but the manufactured product also, with the utmost profit to herself. But these benefits will not follow, or at best will be greatly delayed, unless the business of growing eucalypts is, from the start, established on a sound basis. It is evident that the failure of any considerable number of persons to obtain as good results as they expect will seriously harm the industry, particularly if, on investigation, it is discovered that no substantial basis for their expectations ever existed.

Companies buying land for eucalyptus purposes should consider this seriously, for in that single transaction they determine the success or failure of their venture very largely. The belief is prevalent in California that land for any cause unsuited to agriculture is as good for eucalyptus as is the best agricultural soil. It probably is true that this hardy tree will survive conditions that could not be withstood by ordinary field crops. But, if high returns are sought, the fundamental requisite, good soil, must be used. This fact must not be lost sight of.

In this connection it may be explained that good soil as applied to eucalypts has the same physical meaning as it has when applied to field crops. The soil must first of all be of good depth, that is, six feet or more from the surface to hardpan or other impenetrable material. Shallow soils produce short-boled trees. Equally important is the texture and character of the stratum underlying the soil, owing to its influence on the retention of moisture. Finally, the rainfall must be great enough to produce rapid growth or water must be artificially applied. These conditions of soil may be found in many sections of California, but in choosing land for eucalyptus growing it is vitally essential that the lowest temperature prevailing shall not be too cold for the species to be grown. Generally, it is necessary to confine the search to areas where the temperature is always about 25° F. Another factor of importance is that of transportation. Sufficient foresight should be exercised to guard against the exhaustion of profits by high freight rates, for the output of an acre of well-developed trees is exceedingly heavy. To meet this the farther-sighted growers are purchasing land situated along a railroad near the coast or, better still, along a navigable river.

Having selected good land, the actual development work begins. This consists in growing or purchasing seedlings of the best species and of hardy character. The work of growing seedlings is extremely exacting, for they must have constant care and attention from the time the seed is sown till they are set in the field. Especially must care in their watering be exercised, for on the amount and time of application of water depends not only the thrift and development of the seedlings, but determines whether they become victims of the fungous disease known as "damping off." Inexperienced growers almost always lose heavily from this cause, and even the most expert are not exempt. In almost all publications giving instructions on the best methods of seedling culture shading is recommended. It is questionable, in the light of recent experiments, whether this is either necessary or desirable. It is believed that hardier plants in greater numbers can be raised without shelter from the sun, although this will depend to some degree upon the exposure of the nursery site.

What has been said about the necessity of selecting good land applies equally to its preparation. Shallow plowing has long been the custom of those tilling large areas for wheat and other surface crops. I question if such tillage is the best for wheat, certainly it is not for eucalypts. Deep plowing should always be practiced, the deeper the better. As an illustration of this may be cited the usually luxuriant growth of blue gum on the dredged land at Natoma, Sacramento County. There, on land plowed by the gold dredgers to a depth of twenty feet or more, this species is making as good growth as can be found in the State. At first glance dredged land appears to be irrevocably ruined for crop purposes. It is only when we remember that dredging is merely another name for deep plowing that the reason for this thrifty growth dawns upon us.

In the same measure that good land and thorough tillage are necessary preparations for an eucalypt crop are careful planting and frequent cultivation during the first two years essential. This is the period during which the character of the crop is determined and every one of these fundamentals must be shaped as though it were the determining factor. Neglect of any one will produce its corresponding deficiency in the matured product.

The age at which eucalypt plantations become marketable is a subject on which opinions differ greatly. It should be borne in mind that this is a matter which many factors will determine. In the first place by age is meant financial age, that is the time in the life of a plantation when, considering rate of growth, quality of product, distance to market and rate of sprout growth together, it is determined with approximate exactness that more money will be made by cutting than by holding the trees. It is readily understandable that this is so. For, if at the end of ten or twelve or fifteen years it is found by measurement that the production of lumber is greater, quantity and quality considered together, after deducting loss of suppressed trees than it would be by the succeeding sprout growth then certainly the financial cutting time is still ahead. Of course, this is reasoning without reference to the bank account of the owner. It may very well happen that he will decide to forego maximum yield for the sake of returns before the financial cutting age is reached. In this connection it is debatable as to what course should be followed. It would seem better business to borrow, using the plantation as security, than to sacrifice too greatly. Likewise the demands of the market are important in that they determine the character of the product which will yield the highest financial returns. Thus market demands have their influence on the financial cutting age. Also is the location of the plantation as regards accessibility to market a prominent factor. It will be readily seen that if the market demands determine cordwood to be the most valuable product, the financial cutting age might lie anywhere between the fifth and tenth year. But if the tract is so located that the profits on cordwood will be devoured by scarcity of labor, high wages or heavy transportation charges then a cutting age for a more easily handled product must be selected. These considerations demonstrate how impossible it is to say in advance that the grove will be harvested when ten or twelve years of age.

Many people noting the tremendous acreage being planted have voiced the question, "Will not the industry be overdone? Granting there is now a market for all that can be raised will not the yield a dozen years hence be so great that the price will drop?" Circular No. 116 of the Forest Service sheds considerable light on this phase of the eucalyptus problem. Therein it is set forth that during the period 1899 to 1906 the hardwood lumber cut decreased 15.3 per cent, the decrease taking place at a time when there was the strongest demand ever known for every class of structural material; when the output of pig iron increased 15 per cent, that of cement 132.17 per cent and even that of softwood lumber 15.6 per cent. That the decrease was due to diminished supply rather than to lessened demand seems to be proved beyond question for during the same period the wholesale price of various classes of hardwood lumber advanced from 25 per cent to 65 per cent. Every kind of hardwood found in quantity sufficient to make it useful has been put on the market and hardwood timber is now being cut in every state and every locality where it exists in quantity large enough to be cut with profit. These conditions could not prevail were the decrease in production due to a falling off in demand. In Ohio the decrease in hardwood products between 1900 and 1905, according to census reports, amounted to 57.4 per cent; the rank of the industry fell from fourth to twentieth place and the number of employees decreased 40 per cent. In Indiana, during the same period, the value of the products fell from third to eighth place; the value of the products decreased 27.1 per cent; the number of employees decreased 42.6 per cent. This by way of showing the threatening position in which the hardwood industry stands and how improbable it is that the eucalypts grown in California will cause an oversupply.

But the question arises, "Granting all this, is the quality of the eucalypts such that the wood can be readily substituted for hardwoods in common use?" An unqualified answer in the affirmative can be safely given. For although the tests of the wood have not as yet been exhaustive, they have proceeded so far and with such favorable results that the wood of the commercial species of eucalypts can be likened in quality to the best grades of hickory. This insures its value for structural purposes and with its susceptibility to a high polish guarantees its employment in vehicle and furniture manufacture. From the standpoint of utilization the better species of eucalypts leave nothing to be desired.

These statements are made with full knowledge of the experience among those who have used the wood in green condition that it checks badly and does not hold its shape. Indeed, the practice of using green wood has been so general that a feeling exists that eucalyptus will not yield to seasoning methods. Nothing could be more absurd. The wood is hard, dense, and of close grain. It grows rapidly, and hence is full of sap. Naturally, if the juices are drawn out quickly, something must give way. But if the wood is understood and rational, slow-seasoning methods are applied the eucalypts will be found to respond to them as do the hardwoods in the East. It is safe to say that the experience with eucalyptus of Californians—long accustomed to redwood and pine—would not have been duplicated if they had been handled by men accustomed to handling green hardwoods.

These statements embody some of the possibilities of the eucalyptus industry. We have noted that the growth of these trees is fully five times as rapid as that of any Eastern hardwood; that, on account of its climatic requirements, it can not be grown commercially in the United States outside of California; that its wood is capable of substitution for the Eastern hardwoods rapidly nearing exhaustion. Do not these circumstances justify faith in the industry? Consideration of them has led many to interest themselves in the growing of eucalypts and the sale of eucalyptus lands. At this time there are fully one hundred companies dealing in some sort of eucalyptus commodity, and, very regrettably, some of these companies are of wildcat nature. This is inevitable in an industry of this kind when in the hands of men expert in salesmanship but ignorant of soils and tree culture. They have very naturally confined their energies to those features of the business they were familiar with, leaving the great fundamental problem of tree culture in the background. Not content with this, in some instances they have greatly overestimated possible returns in an effort to catch the buyer with a fondness for long shots. Lest I be misunderstood, let me say that I am not talking about all eucalyptus companies. There are many high-class, thoroughly honest companies growing trees in California, who, by the care of their plantations, prove they want to give investors the worth of their money. Such companies should be encouraged, for in addition to enriching themselves and those associated with them, they are adding to the Nation's timber supply.

PRESIDENT JEFFREY. Now we will ask you to remain a few minutes and let the Committee on Resolutions be relieved of its duties. Just read them right through and if there is any one objects to any resolution make a note of it.

Mr. Kellogg read the following resolution:

RESOLUTION OF APPRECIATION TO A. R. BRIGGS.

Whereas, In the efficient and persistent efforts of Mr. Arthur R. Briggs in our behalf on the question of sulphur-cured fruits, all the growers of drying fruits in the State have been greatly benefited; therefore, be it

Resolved, That this convention extend to Mr. Arthur R. Briggs our heartfelt thanks by rising vote.

PRESIDENT JEFFREY. We will just arise and give that vote now.

The convention expressed its approval of the resolution by rising.

Mr. Kellogg read the following resolutions:

THANKS TO PROFESSOR STUBENRAUCH.

Whereas, The very persistent and efficient work of the Department of Agriculture, represented by Prof. A. V. Stubenrauch and his co-laborers, has resulted in showing us the great benefit of careful handling of our fruit in picking and packing, and they have also revealed the probable effect of various molds in relation to the keeping qualities of our various fruits,. especially grapes; therefore, be it

Resolved, That the fruit growers of California in convention assembled, express our appreciations of the work and assistance from the Department of Agriculture, at Washington, with their able corps of scientific and practical experts who have done so much to advance the interests of fruit men. We recognize the careful and conscientious work of Prof. A. V. Stubenrauch as of an inestimable value to us, and hereby express our appreciation of his personal work, and thank him for it.

RESOLUTION FOR PLANT PATHOLOGIST.

Resolved. That this State Fruit Growers' Convention urgently request that the Department of Agriculture continue its experimental work, and add to its working force a Pathologist to give special study to these molds to see if we can not overcome the great losses from this source.

RESOLUTION OF THANKS TO PROFESSOR HERMS AND DR. SNOW.

Resolved, That we are indebted to Prof. W. B. Herms of the University of California and to Dr. W. F. Snow of the State Board of Health for their valuable and interesting lectures during the session.

Resolved, That the thanks of this convention are due and are hereby extended to all those who have prepared papers and addresses for this convention.

RESOLUTION ASKING LEGISLATURE FOR INSECTICIDE LAW.

Whereas, One of the controlling factors of successful horticulture in the State of California is the control of pests;

Whereas, A great many nostrums, concoctions, would-be remedies and adulterated chemicals have been foisted upon the horticultural people of the State; and

Whereas, There is more than a million dollars spent each year in California for sulphur, cyanide, sulphuric acid, lime-sulphur solution, bluestone, arsenate of lead, Paris green, soluble oils, etc.; therefore, be it

Resolved, That the State Fruit Growers' Convention, assembled December 10, 1909, petition the State legislature to pass a pure insecticide and fungicide law, which will guarantee to the consumer an accurate knowledge of what he buys; which will require a printed analysis on the outside of every package; that shall show the percentage of the active material contained therein, and analysis which will be comprehensive to the horticulturist, and one which will make the manufacturer of insecticides and fungicides, with his agents, criminally liable for any imposition, or for any misleading or false statement thereto.

Resolved, That a committee of five be appointed by the chair to draft a bill covering these several points. This committee of five shall consist of the State Commissioner of Horticulture, assistant professor of the chemistry of insecticides of the University of California, two manufacturers, and the professor of entomology of the University of California.

RESOLUTION ON CHAIR OF AGRICULTURAL ECONOMICS.

Resolved, That we request the State University to establish a Chair of Agricultural Economics.

RESOLUTION OF THANKS TO PRESS AND RAILROADS.

Resolved, That we thank the great metropolitan press of the State for the fair and uniformly correct reports of our deliberations.

Resolved, That we thank the local press for all their courteous recognition.

Resolved, That we extend our thanks hereby to the lines of railroads and steamships for their usual courtesies and concessions.

RESOLUTION ON A FEDERAL LINE OF STEAMERS.

Whereas, Transportation and the cost of seed is the most important question before the producers of California; and

Whereas, Efforts have been made to bring about legitimate competition between California and the market of the East; and

Whereas, The United States Government operates a line of steamers on the Atlantic in connection with the Government-owned railway across the Panama Isthmus; and

Whereas, An effort will be made to have the Government operate a line on the Pacific, to connect with the railway across the Panama Isthmus, and thus give to California a complete service; and

Whereas, The present system does not afford to California the benefits of legitimate competition, owing to the fact that the Pacific Mail Steamship Company operating on the Pacific is under the control and domination of the transcontinental railroads; therefore, be it

Resolved, By the thirty-sixth California Fruit Growers' Convention, assembled in annual meeting at Watsonville, California, that we do hereby memorialize the President of the United States, William H. Taft, Secretary of War Dickinson, and the congress of the United States, to speedily relieve the situation by the establishing of a Federal line of steamers on the Pacific, to connect with the Government-owned line of railway across the Isthmus of Panama and the Federal line of steamships on the Atlantic, thus giving to California a through and complete service; be it further

Resolved, The President of the United States and the United States Congress be memorialized to enact such legislation as will increase the powers of the Interstate Commerce Commission, so that it may be able to prevent any increase in freight rates at any time, unless the proposed increase in freight rates shall be found by said Interstate Commerce Commission to be reasonable and justifiable; be it further

Resolved, That we favor the enactment of laws whereby the capitalization of all railroad and express companies engaged in the transportation business shall be fixed and determined as a basis upon which transportation charges shall be fixed, so that rates charged may be regulated by law.

Resolved, That copies of these resolutions be transmitted to the President of the United States, the Secretary of War, and the United States congress and senate, and to the California congressional delegation.

RESOLUTION ON POLYTECHNIC SCHOOL.

Whereas, In every county there are boys and girls so situated as to prevent them from getting an agricultural or mechanical education, thereby being a great loss to the State, the public greatly losing thereby;

Whereas, The best interests of any community are conserved when every person is able to give the best service possible;

Whereas, The California State Polytechnic School is an institution for the purpose of bringing about the much desired conditions; therefore,

Resolved, That the legislature be asked to enact such laws as may permit each county, through its board of supervisors, to give a limited number of scholarships in the said school, in proportion to population and under proper qualifications.

RESOLUTION OF THANKS TO CITIZENS OF WATSONVILLE.

Resolved, That the unbounded hospitality of the citizens of Watsonville has been accepted with great satisfaction. To the ladies especially who entertained us so delightfully with choice music and refreshments, we thank them with hearty appreciations for the same. The lantern exhibit by the Board of Trade, showing the fertile Pajaro Valley, has been fully appreciated and enjoyed.

RESOLUTION OF THANKS TO CHRISTIAN CHURCH.

Resolved, That the concessions made by the Christian Church of Watsonville in permitting us to occupy their splendid auditorium and commodious side rooms, also of the careful attention given by its pastor and official members for the comfort and convenience of the convention, is deserving of, and does hereby receive, our most heartfelt thanks.

MR. KELLOGG. So far we have agreed in our report.

MR. STEPHENS. I move that the committee's action be adopted thus far.

The report of the Committee on Resolutions was adopted.

MR. KELLOGG. Here is another.

RESOLUTION ON EXPERIMENTS WITH SPRAYS.

Resolved, That we request the State University Agricultural Farm at Davis to conduct experiments in the use of both wet and dry sprays, to determine whether the results can be determined by dry method of spraying.

Resolution adopted.

MR. KELLOGG. Now comes a matter of law, more than anything else, and the committee did not feel competent to pass upon it, as none of us are lawyers, but those who have presented it have studied it and I have no doubt it is correct.

RESOLUTION RELATING TO AMENDMENT OF HORTICULTURAL LAW.

Whereas, An act passed by the last legislature of the State of California, and which said act is known as the County Horticultural Law, and which among other things attempts to amend sections 2322, 2322a, 2322b, 2322c, 2322d, and 2322e of the Political Code of this State, relating to the county board of horticulture, is defective, vague, and uncertain in certain respects; therefore, be it

Resolved, By the State fruit growers in convention assembled at Watsonville, California, on December 8, 9, 10, 1909, that our senators and assemblymen be requested to use their best efforts to have said law amended in the following respects:

1. That section 2322d be amended by inserting after the word "day," at the end of the first section therein, the following: "During the time actually employed as such officers."
2. That a new section be added to said act to read as follows: "That the powers and duties of the deputy county horticultural commissioners shall be the same as those of the county horticultural commissioner."
3. That section 2322b be amended so as to contain the following: "The state commissioner may issue commissions as quarantine guardians to the county horticultural commisioner, or his deputies appointed by him."
4. That section 2322d be amended so as to contain the following: "In the case of the commissioner himself, his compensation shall be $6 per day when actually engaged in the performance of his duties; *provided*, that the term 'duties' shall include investigation and experimentation in the matter of devising new methods and improving upon old methods of combating and eradicating insect pests and plant diseases, and he shall be allowed, in addition to his said salary, necessary traveling and office expenses, including the amount necessarily expended in making public his said investigations."
5. That a new section be added to said act to read substantially as follows:

"The boards of supervisors throughout the State are hereby empowered to set aside a sufficient sum to pay the salaries and other expenses set forth in this act."

6. That a new section be added to said act to read substantially as follows:

"Any board of supervisors shall have the power to employ at a reasonable compensation, and for whatever time is in their judgment necessary, an entomologist, whose duties may be to carry on investigations and experimentations for the purpose of devising the best and cheapest methods for combating insect pests and diseases of all agricultural crops and for the eradication of noxious weeds and other pests, and when deemed advisable by him, to issue bulletins or take other means of supplying the public with such information."

Respectfully submitted.

GEO. D. KELLOGG,
J. P. DARGITZ,
A. N. JUDD,
Committee on Resolutions.

The resolution was adopted.

MR. KELLOGG. That completes our report.

PRESIDENT JEFFREY. I have a communication here that it would be a discourtesy to overlook, but I don't know what to do with it. This is dated Auburn, Cal., December 7, 1909, from the Placer County Farmers' Union. Now, this must have the courtesy of a reply, and I suggest that you refer this letter to some one for a reply.

MR. KELLOGG. I move it be referred to the Chairman of the convention for a suitable reply.

The motion was duly seconded and carried.

PRESIDENT JEFFREY. When you go from this convention home, I hope you will say you had a good time and were pleased with Watsonville and her fruits. You have expressed your thanks through your resolutions to the people of Watsonville for what they have done, but you should tell everybody all over the State what they have done for you here. I say, "Hurrah for the people of Watsonville!"

The convention then adjourned *sine die*.

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